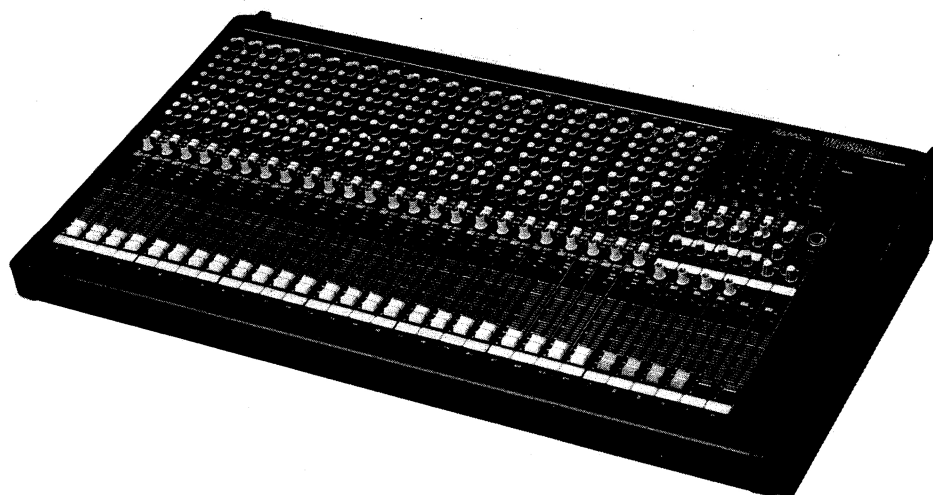


Service Manual

Sound Reinforcement &
Recording Consoles

WR-S4412/WR-S4416/WR-S4424



TECHNICAL SPECIFICATIONS

	Standard	Measurement Condition
Frequency Response	+1/-2.5dB at 20Hz~20kHz	Input "A" to Group Out, +4dB IN, +4dB OUT, RL=600 Ω , Norminal Setting
T. H. D.	< 0.1% at 20Hz to 20kHz	Input "A" to Group Out, +4dB IN, +4dB OUT, RL=600 Ω , Norminal Setting
Equivalent Input Noise	< -126dB at 150 Ω Input Source Impedance	Audio Band Pass Filter W. T. D. Mono IN "A" to Group Out
Maximum Voltage Gain	94 +2/-2dB at 1kHz	Mono input "A" to Group to Master Out RL=10k Ω
Crosstalk	< -70dB at 1kHz Adjacent Input Channels & CH SW & Fader	Input "A" to Group Out, +4dB IN, +4dB OUT, RL=10k Ω , Norminal Setting
C. M. R. R.	< -80dB at 1kHz	Input "A" to Group Out, Trim at "-60dB"
Mono Input Equalizer Low Mid. High	Fixed shelving type: 70Hz, $\pm 15 \pm 3$ dB Sweepable peaking type: 200Hz to 6.3kHz, $\pm 15 \pm 3$ dB Fixed shelving type: 12.5kHz, $\pm 15 \pm 3$ dB (High/Low by Frequency Regulation of Shelving $\pm 12 \pm 2.5$ dB)	Input "A" to Group Out, +4dB IN, +4dB OUT, RL=10k Ω , Norminal Setting Each EQ gain "PEAK" or "DIP"

Panasonic

Maximum Input Level	Input A +22dB +3/−0dB Input B +28dB +3/−0dB	Trim at CCW
Maximum Output Level	+24dB +2/−0dB (Group/Master Out Balanced) at 1kHz +20dB +2/−0dB (Aux/Monitor Out Unbalanced) at 1kHz	Input "A", OUT FADER "MAX", +4dB in +14dB out Setting RL=600Ω (GROUP, MASTER, AUX), RL=10kΩ (MONITOR)
Residual Output Noise	< −90dB by Group, Aux, Master, Monitor Output	Output Faders & Level Control at "KILL", RL=600Ω (EX, 10kΩ : Monitor) Audio Band Pass Filter W. T. D.
Fader	100mm Stroke High Precision Carbon Fader	
Meter	VU Response 12 Segment 3 Color LED Bar-graph Meter	
Power Supply	WR-S4412/B, WR-S4416/B, WR-S4424/B: 240V AC, 50/60Hz WR-S4412/G, WR-S4416/G, WR-S4424/G: 230V AC, 50/60Hz	
Power Consumption WR-S4412 WR-S4416 WR-S4424	55W 60W 70W	
Dimensions (W × H × D) WR-S4412 WR-S4416 WR-S4424	12ch 650mm × 171mm × 584mm 16ch 766mm × 171mm × 584mm 24ch 998mm × 171mm × 584mm	
Net Weight WR-S4412 WR-S4416 WR-S4424	12ch 18.5kg 16ch 21.0kg 24ch 27.5kg	

* 0dB=0.775 vrms

INPUT SPECIFICATION

Input Characteristics	Indicated Impedance	Nominal Source Impedance	Nominal Load Impedance	Nominal Level	Maximum Level	Connector
Mono Input A	5kΩ	150 - 600		−60 - +4dB	−38 - +22dB	Electronically-Balanced XLR
Mono Input B	10kΩ	150 - 600		−54 - +10dB	−32 - +28dB	Same above, T/R/S phone
Input/Output Insertion Return	10k	600		−2dB	+20	Unbalanced, T/R/S phone
Sub Input	10k	600		+4	+26	Unbalanced, T/R/S or T/S phone
Aux Return	10k	600		+4	+26	Unbalanced, T/R/S phone
Talk Back	5k	150 - 600		−50 - −20	−28 - +2	Unbalanced, XLR

OUTPUT SPECIFICATIONS

Output Characteristics	Indicated Impedance	Nominal Source Impedance	Nominal Load Impedance	Nominal Level	Maximum Level	Connector
Group, Master Output	600		600	+4	+24	Electronically-Balanced, XLR
Aux Output	600		600	+4	+20	Unbalanced, T/R/S or T/S phone
Input/Output Insertion Send	10k		10k	-2	+20	Unbalanced, T/R/S phone
Direct Output	10k		10k	-2	+20	Unbalanced, T/R/S or T/S phone
Monitor Output	10k		10k	+4	+20	Same above
Rec Output	10k		10k	-10	+12	Unbalanced, RCA pin
Headphone Output	400		400	—	160mW	Unbalanced, T/R/S phone

PRECAUTIONS

Read the following section carefully to insure safe and proper use of the mixer.

NEVER INSERT OR REMOVE MODULES FROM THE CHASSIS WHEN THE POWER IS TURNED ON. BE SURE TO TURN THE POWER OFF OR DAMAGE TO THE MIXER WILL RESULT.

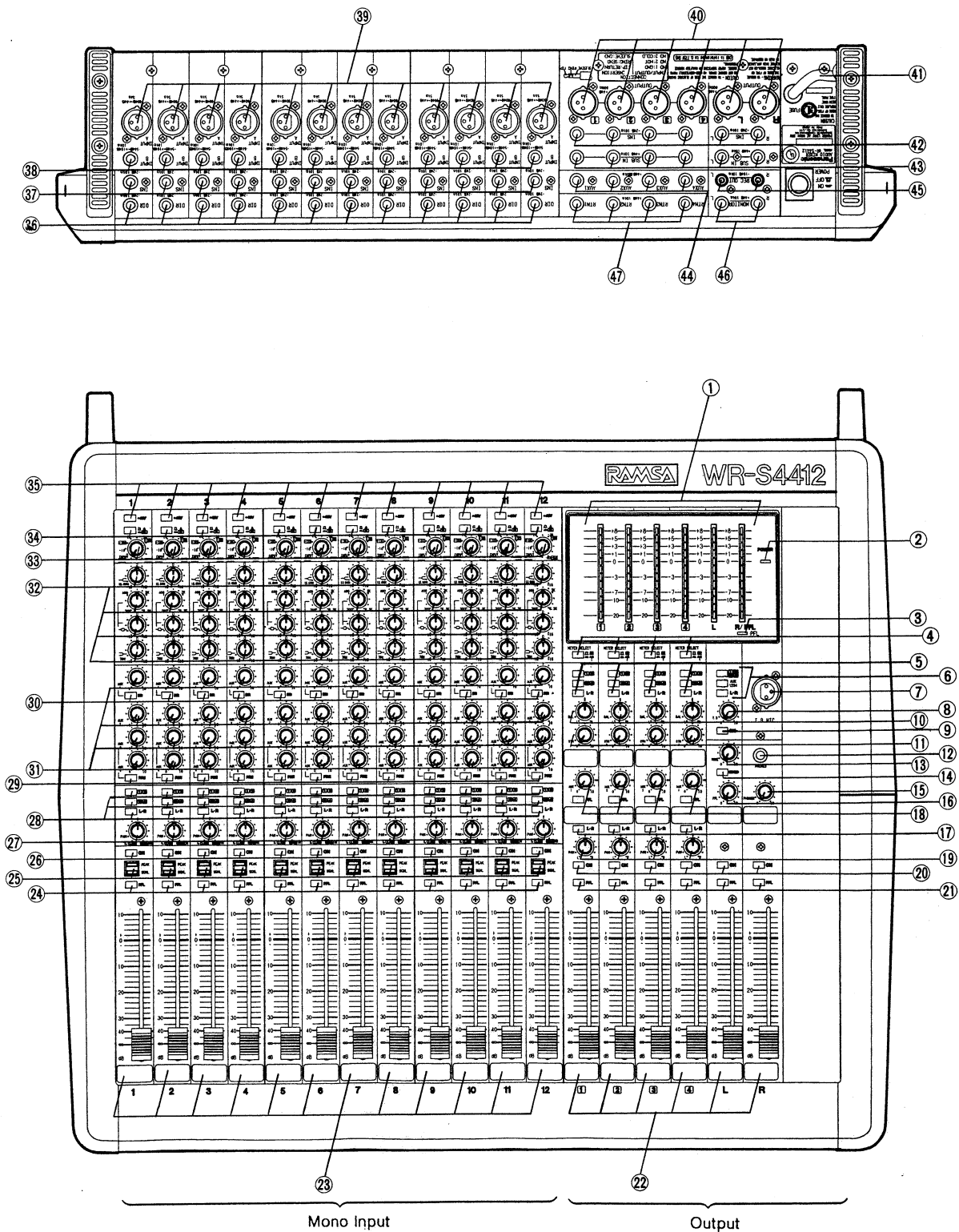
1. A 48 volt potential exists between pins 2 and 1 and between pins 3 and 1 of the input XLR connectors when phantom power is turned on.
2. Turn on the phantom power switch only after a connector has been inserted into that channel in order to prevent shocks and avoid damaging clicking and popping sounds. When disconnecting phantom microphones, wait at least 20 sec. after turning phantom power off.
When disconnecting the microphone, set the channel on switches to OFF position and faders to "— ∞".

3. Be especially careful to keep the phantom switch turned off when using an unbalanced type microphone or when any other type equipment is connected the input connectors. Failure to do so may result in damage, smoke, or fire.
4. When using the input selector switch while the phantom power is turned on, turn the output fader down to avoid any popping noise which might damage the speakers or other equipment connected to the mixer.
5. The phantom power supply employs a slow start system to avoid click sounds from being produced. Allow 1 minute after pressing phantom power switch for voltage to stabilize.
6. Set all faders to minimum and channel switches off when turning the power on and off.
7. Avoid using the mixer near anything that generates electric fields, such as transformers, lighting, transmitters, CRT monitor etc.

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MAJOR OPERATING CONTROLS AND THEIR FUNCTIONS



1. 12-point LED Bar-graph Meters (1/2/3/4/L/R)

These LED peak reading meters are designed to have quick attack time to monitor transients and slow decay time for optimum visual indication. There are 3 color ranges, along with dB graduations relative to nominal level: Green for -20 dB to 0 dB, Yellow for +1 dB to +5 dB, Red for +8 dB or more.

- 1: This meter displays Group 1 output level or AUX 1 output level.
- 2: This meter displays Group 2 output level or AUX 2 output level.
- 3: This meter displays Group 3 output level or AUX 3 output level.
- 4: This meter displays Group 4 output level or AUX 4 output level.

L:

This meter displays Left Master output level.

R/PFL:

This meter displays Right Master output level or PFL level. Meters 1-4 are switch selectable. The R/PFL meter is automatically switched any time a PFL button is pressed.

2. Power Indicator LED

This LED lights when the Power Switch is turned on.

3. PFL Indicator LED (R/PFL)

This LED lights when any PFL Switch is turned on. The R/PFL 12-point LED bar-graph meter displays PFL signal level when this LED is lit.

4. Meter Selection Switches (METER SELECT, 1/2/3/4)

These switches are used to select either Group or AUX bus signals to be displayed by the 12-point LED bar-graph meters 1-4. Pressing the switch down selects the AUX signal. The up position selects Group.

5. AUX Return Assign Switches

These switches route the stereo AUX Return signals to the group and master busses. The left input signal can be sent to Group 1, Group 3, and L Master. The right input signal can be sent to Group 2, Group 4, and R Master.

For more information regarding connection of AUX Return signals, see number 3-1 on page 8, "AUX Return Input Jacks".

6. Talk Back Assign Switches

These route the signal input via the TB Mic connector. The talk back signal is assignable to all group, master, and AUX busses.

7. Talk Back Microphone Connector (T.B MIC)

This XLR female connector is used for the connection of a talk back microphone.

8. Talk Back Level Control

This is a dual-function control to simultaneously adjust the talk back input sensitivity and the output level of the talk back signal.

9. Talk Back ON/OFF Switch (ON)

This is a push-push type switch. The Talkback function is active while the switch is held in the down position.

10. Balance Controls (BAL, L-R)

These controls set the balance between the Left and Right AUX RTN input signals.

11. AUX Return Input Controls (RTN 1/2/3/4, 0-10)

These controls set the level of Stereo AUX Return input signal to be sent to the assigned busses.

12. Phone Jack (PHONES)

1/4" TRS phone jack for headphone.
Maximum output is 160 mW / 400 ohms.

13. Monitor Master Level Control (MONI, 0-10)

This control adjusts the level of the monitor outputs. The takeoff point for the monitor signal is either L/R Master or PFL. When any PFL button is depressed, it takes priority over the L/R Master for being sent to the Monitor and Headphone Outputs. Therefore, any buss can be monitored, as well as any input channel.

14. Mono Monitor Switch (MONO)

Pressing this switch down to the mono position combines the left and right monitor into a mono signal, then sends it to the left and right Monitor outputs.

15. Headphone Level Control (PHONES, 0-10)

This control is used to set the headphone level. The signal sent to the headphone output is the same as the one being sent to the monitor outputs (L/R Master or PFL).

16. PFL Control (PFL 0-10)

This control adjusts the level of the PFL signal present at the monitor outputs and headphone outputs. Proper setting of this control avoids variances in level when switching between Master and PFL mode.

17. Group L-R Send Switches (L-R)

When these switches are turned on, the Group signal is sent to the L/R Master busses. This is useful for creating a submix.

18. AUX 1-4 Master Level Controls (AUX, 0-10)

These controls adjust the overall level of each AUX output signal.

19. Group Pan Pot Controls (PAN, L-R)

These controls are used to adjust the left/right balance of the Group signal sent to the Master L and R channels via the L/R Send switches.

20. Channel On Switches (ON)

These are the on/off switches for the Group and Master Outputs.

21. Pre Fader Listening Switches (PFL)

These switches may be pressed to send any of the Group, AUX, or Master busses to the Monitor and Headphone Outputs. The PFL signal takes priority over the L/R Master monitor signal.

22. Output Faders

These high precision type 100 mm carbon faders are used to adjust the Group and Master output level. Position 0 represents the nominal output level.

23. Input Faders

These high precision type 100 mm carbon faders are used to control the level of input channels signal being sent to the mixing busses. Fader should be at "0" for obtaining nominal level.

24. Pre Fader Listening Switches (PFL)

These switches may be pressed to send individual input channel or mixing buss signal to the Monitor and Headphone outputs. Multiple PFL buttons may be turned on to monitor any combination of signals. The PFL signal takes priority over the L/R Master monitor signal, which is present at the Monitor and Headphone outputs when all PFL buttons are off.

25. Signal Indicator LED (PEAK/SIGNAL)

These LEDs indicate input head amplifier signal status. These light green when the signal reaches a level approximately 8 dB below nominal, and turn red when the signal is within 8 dB of clipping level. In case of a consistent red indication, the input level control (INPUT) should be turned to counterclockwise.

26. Channel On Switches (ON)

The input signal sent to the Master, Group, and AUX mixing busses is passed (on) or muted (off) by these switches.

27. Pan Pot Controls (PAN, L/1/3,R/2/4)

These controls divide the input signal into separate left and right, and sets the relative level (balance) between them.

This mixer has odd/even group panning, which means that Groups 1/2 and Groups 3/4 are set up as stereo pairs. Therefore, panning left will cause signals to be sent to L Master, Group 1, and Group 3. Panning right will send the signals to R Master, Group 2, and Group 4.

28. Program Bus Assign Switches (1/2, 3/4, L-R)

Input signals may be sent to Groups 1-4 and L-R Master Busses by means of these switches.

29. Pre Fader Switches (PRE)

These switches select between a pre- or post-fader takeoff point for the AUX 3 and AUX 4 signals. Pre is normally used for monitoring applications, while post is effective when using AUX 3 and AUX 4 as effects sends.

The pre-fader signal can be set to either pre- or post-EQ by means of internal jumpers.

NOTE:

JUMPER MODIFICATIONS MUST BE PERFORMED BY AUTHORIZED SERVICE PERSONNEL.

30. Direct Out Switches (DIR)

Selects the signal path for AUX 1. When the switch is down, signal is sent from the AUX 1 control to the input channel's Direct Output. The up position routes the AUX 1 signal to the AUX 1 mixing buss. No signal is present at the channel's Direct Output when this switch is up. Example for use: A particular effect may be needed for only 1 input source. The input source gets routed to the effect via its input channel's Direct Output, while the send level is set by the AUX 1 control. Without this function, the master AUX 1 output would have to be connected to that effect. AUX 1 could then not be used on any other input channel, since the effect was intended for use with only the one input source. In other words, the number of effects sends available is not limited by the 4 AUX busses.

31. AUX Level Controls (AUX 0-10)

These set the signal level being sent to each of the AUX mixing busses (and Direct Out in the case of AUX 1)

32. Equalizer

Three-band equalizer :

The high and low bands are a shelving type with cutoff frequencies of 12.5 kHz and 70 Hz respectively. The mid band is a peaking type with a continuously variable frequency range of 200 Hz - 6.3 kHz.

High : ± 15 dB (± 12 dB at 12.5 kHz) Shelving

Mid : ± 15 dB (200 Hz to 6.3 kHz) Peak/dip

Low : ± 15 dB (± 12 dB at 70 Hz) Shelving

33. Input Level Controls (INPUT)

These controls set the sensitivity of the A and B universal mic/line inputs.

Proper setting of these controls provides optimum signal-to-noise ratio and approx. 22 dB of headroom between -2 dB and -60 dB at A-input. (More than 18 dB between $+4$ dB and -2 dB.) The A input nominal level range is -60 dB to $+4$ dB. The B input nominal level range is -54 dB to $+10$ dB.

34. Input Selector Switches

These switches are used for selecting either the A (XLR) Input or B (1/4" TRS Phone) Input.

Both A Input and B Input are electronically balanced.

35. 48V Phantom Power Switches (+48V)

These are ON/OFF switches for 48 volt phantom power, which is used by condensor microphones.

Phantom power is supplied only to the A input (XLR) connector.

36. Direct Out Jacks (DIR, -2 dB 10 kohms)

(1/4" Phone Jack, -2 dB, 10 kohms, unbalanced)

Output signal for each input channel. The Direct Out is fed by the AUX 1 control when the DIR switch is pushed in. May be used for effects send, multitrack tape recorder send; etc.

37. Insertion Jacks (INS, -2 dB 10 kohms)

(1/4" TRS Phone Jacks, -2 dB, 10 kohms, unbalanced)
A pre-equalizer patch point. Equipment connected to this point becomes, in effect, part of the mixer circuit. Used for signal processors as such as equalizers, compressors, limiters, etc.

A Y-cord adaptor must be used in order to split this terminal into separate output (Send) and input (Return) connectors. Insertion jack terminals are wired as:

Tip : Return
Ring : Send
Sleeve : Earth

Insertion points are provided for every input channel - 12(WR-S4412), 16(WR-S4416), 24(WR-S4424).

38. 1/4" Phone Input B Jacks

(INPUT B, -54 dB - +10 dB, 10 kohms)

These are universal Mic/Line input connectors, which are electronically balanced, configured to accept a 1/4" stereo plug wired as:

Tip: Hot
Ring: Cold
Sleeve: Earth

When connecting unbalanced equipment to the mixer, use a 1/4" mono plug wired as tip: hot, and sleeve: earth.

The B input accepts input signals with a nominal level between -54 dB and +10 dB. Input sensitivity is set by the input level control on each channel.

The number of the 1/4" Phone Input B Jacks are : 12(WR-S4412), 16(WR-S4416), 24(WR-S4424)

39. XLR Input A Connectors

(INPUT A, -60 dB - +4 dB, 5 kohms)

These are universal Mic/Line XLR input connectors, electronically balanced, and configured as:

Pin 1: Earth
Pin 2: Hot
Pin 3: Cold

The A input accepts input signals with a nominal level between -60 dB and +4 dB. Input sensitivity is set by the input level control on each channel.

48 V phantom power is supplied to pins 2 and 3 of the connector when the 48 V switch of that channel is turned on.

The number of the XLR input connectors are : 12(WR-S4412), 16(WR-S4416), 24(WR-S4424)

40. Group and Master Output Connectors

(1/2/3/4/L/R)

Output connectors for the Group 1-4 and L-R Master busses (XLR, 600 ohms, +4 dB, electronically balanced).

41. AC Power Cord**42. Group and Master Insertion Jacks**

(INS, -2 dB, 10 kohms)

(1/4" TRS Phone Jack, -2 dB, 10 kohms, Unbalanced)
Group and Master insertion jacks provide a patch point in the output stages for interconnection of accessory equipment.

A Y-cord adaptor must be used in order to split this terminal into separate output (Send) and input (Return) connectors. Insertion jack terminals are wired as:

Tip : Return
Ring : Send
Sleeve : Earth

43. Sub Input Connectors (SUB IN, +4 dB 10 koms)

(1/4" Phone Jack, +4 dB, 10 kohms, Unbalanced)

These are inputs which apply signals directly to the Group 1-4 and L-R Master Busses. These may be used for connection of additional mixers, pre-mixed signals, or any other line-level signal.

44. AUX Output Connectors

(AUX 1/2/3/4, +4 dB 600 ohms)

(1/4" Phone Jack, +4 dB, 600 ohms, Unbalanced)
Output connectors for the AUX 1-4 Busses.

45. Rec Output Jacks

(REC OUT, R/L, -10 dB 10 kohms)

(RCA pin jacks, -10 dB, 10 kohms, Unbalanced)

Master L and R pre-insertion level signals for sending to tape recorder.

46. Monitor Output Jacks

(MONITOR, L/R, +4 dB 10 kohms)

(1/4" Phone Jack, +4 dB, 10 kohms, Unbalanced)

These jacks provide a monitor feed of the L/R Master output or PFL signals. PFL has priority over the L/R Master signal.

This monitor signal is also sent to the Headphone output connector.

47. AUX Return Input Jacks

(RTN 1/2/3/4, +4 dB 10 koms)

(1/4" TRS phone jacks, +4 dB, 10 kohms, Unbalanced)
By using 1/4" stereo jacks, these accept 2 signals on 1 connector to input the returns from a stereo effect or any other stereo line level source (cassette, CD, DAT, etc.).

Tip = L channel

Ring = R channel

Input to the left channel may be sent to Group 1, Group 3, and L Master. Input to the right channel may be sent to Group 2, Group 4, and R Master.

In case it is desired to send a mono return signal, it is accomplished as follows:

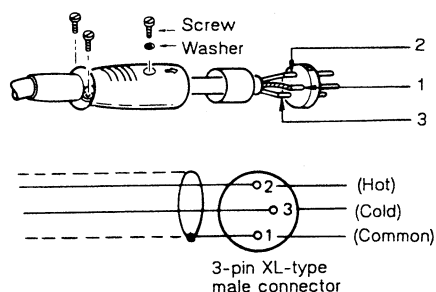
- A. Apply the return signal to either left or right of the AUX Return.
- B. Assign it to a single group bus; for example, Group 1 (press 1/2 assign switch and turn Balance control fully left).
- C. Press the L-R Send switch for Group 1 in. Set the L-R Send Pan control to center detent.
- D. The AUX Return signal will now be sent equally to the left and right master busses.

IN/OUT CABLE INFORMATION

1. XLR Type Connectors

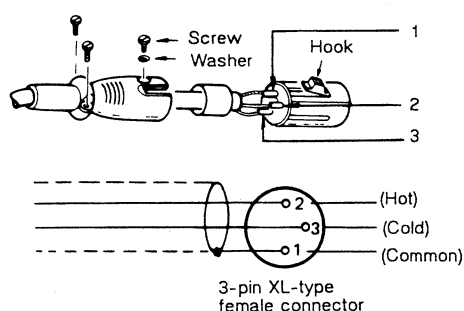
1-1. Balanced Connection (Input)

Connect 2-conductor shielded cable as shown below.



1-2. Balanced Connection (Output)

Connect 2-conductor shielded cable as shown below.

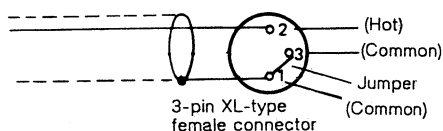


1-3. Unbalanced connection

When connecting unbalanced equipment to the mixer, connect follows : Pin 1 - Common, Pin 2 - Hot, Pin 3 - Common

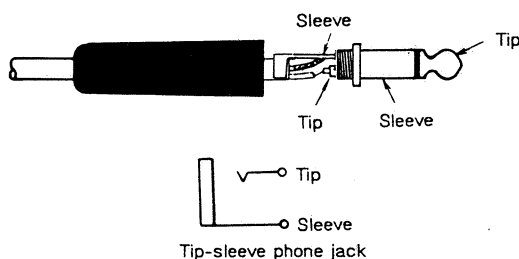
CAUTION :

Do not connect unbalanced microphones to the mixer when using phantom power. Power supply and microphone may be damaged.



2. 1/4" Tip-sleeve Phone Plug (Input and Output)

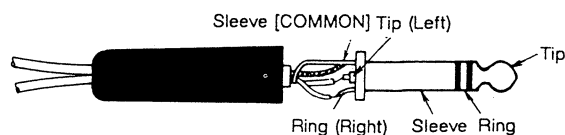
Connect single-conductor shielded cable as shown below (Tip - Hot, Sleeve - Common).



3. 1/4" Tip-ring-sleeve Phone Plug

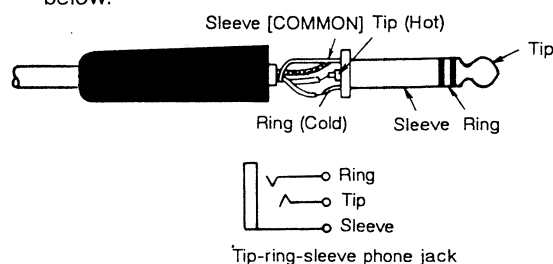
3-1. AUX Return

Connect 2-conductor shielded cable as shown below.



3-2. Input B (Balanced connection)

Connect 2 single-conductor shielded cables as shown below.

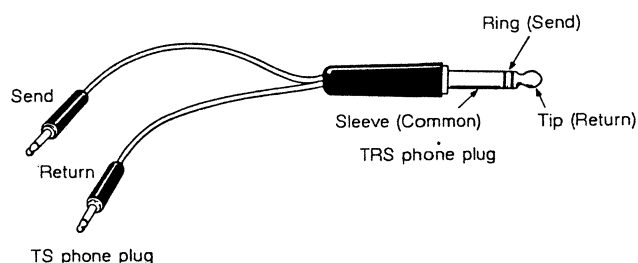


Note :

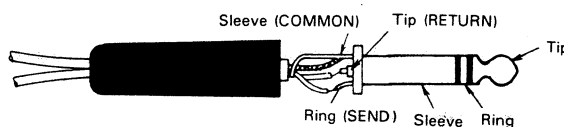
For unbalanced connection on Input "B", use a single conductor shielded cable with a 1/4" mono plug, as shown in 2.

3-3. Insertion

For insertion at the patch points, use a Y-cord adaptor, wired as tip ; return, ring ; send and sleeve ; common on a 1/4" TRS phone plug.

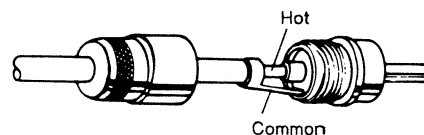


Connect 2 single-conductor shielded cables as shown below. The other end of the shielded cables must have appropriate mating plugs or jacks, or be connected to a patch bay.



4. RCA Pin-plug Input and Output

Connect single-conductor shielded cable as shown below.



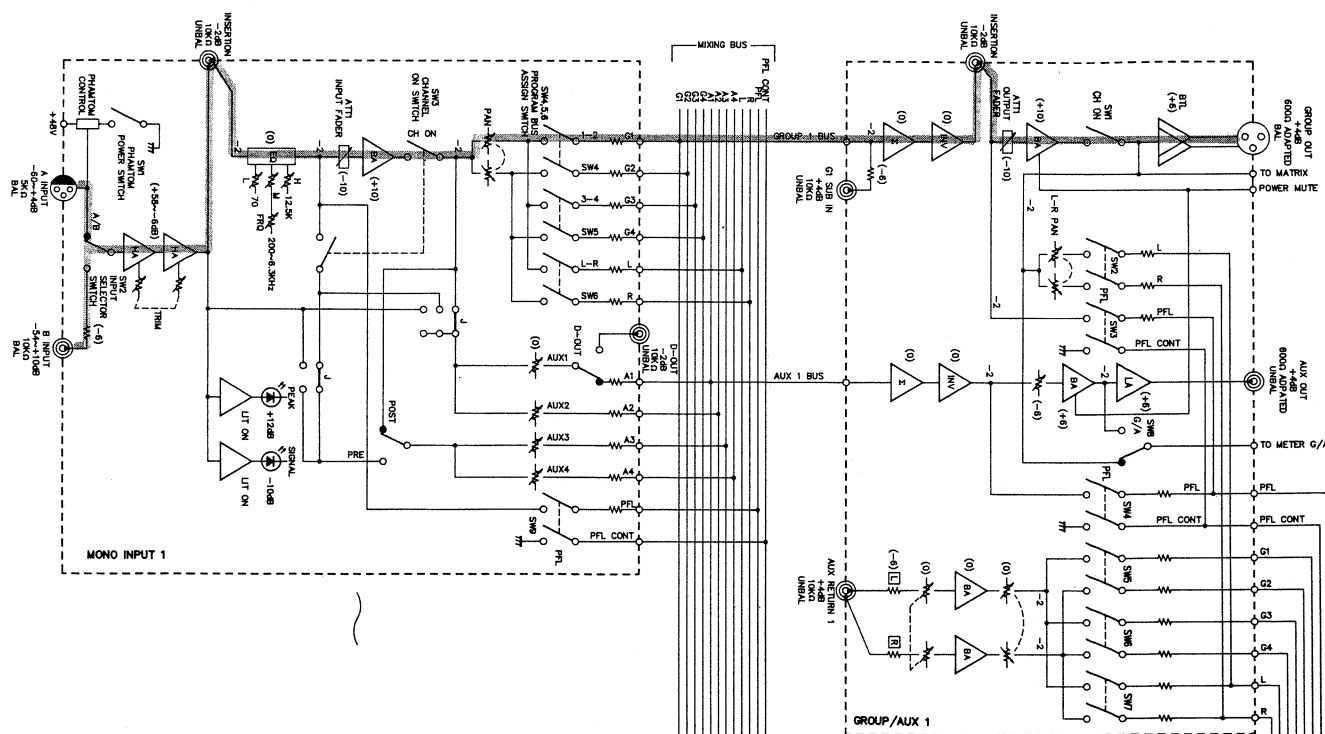
OPERATION CHECK

Instructions for Operation Check Items 1-6

- Input and output levels are referenced to 0 dB = 0.775 Vrms except where indicated otherwise. Input levels shown in the chart below will produce output levels as indicated, assuming that pan controls are centered, and outputs are terminated with 600 ohms where noted. If those outputs are not terminated, higher output levels will result. All procedures which include application of signal to Mono Inputs state A and B inputs should be checked. However, if it is verified that both A and B inputs are working for any one procedure, then the remaining procedures may be run using either A or B only.

Mono Input section		Normal input level	
Controls and switches	Setting	Input	Level
Input Section A/B Switch TRIM control	A or B At "−60" on scale (MAX)	A Input	−54 dB at 1 kHz
		B Input	−48 dB at 1 kHz
Equalizer	At "0" on scale (CENTER DETENT)	Peak level indicator	
Input fader	At "0" on scale	Apply −36 dB signal to A Input. Insure "Peak" indicator is lit.	

1. A INPUT → GROUP OUT B INPUT → GROUP OUT



Set the control and switches on the Mono input section and Group/AUX section as follows.

■ MONO Input Section

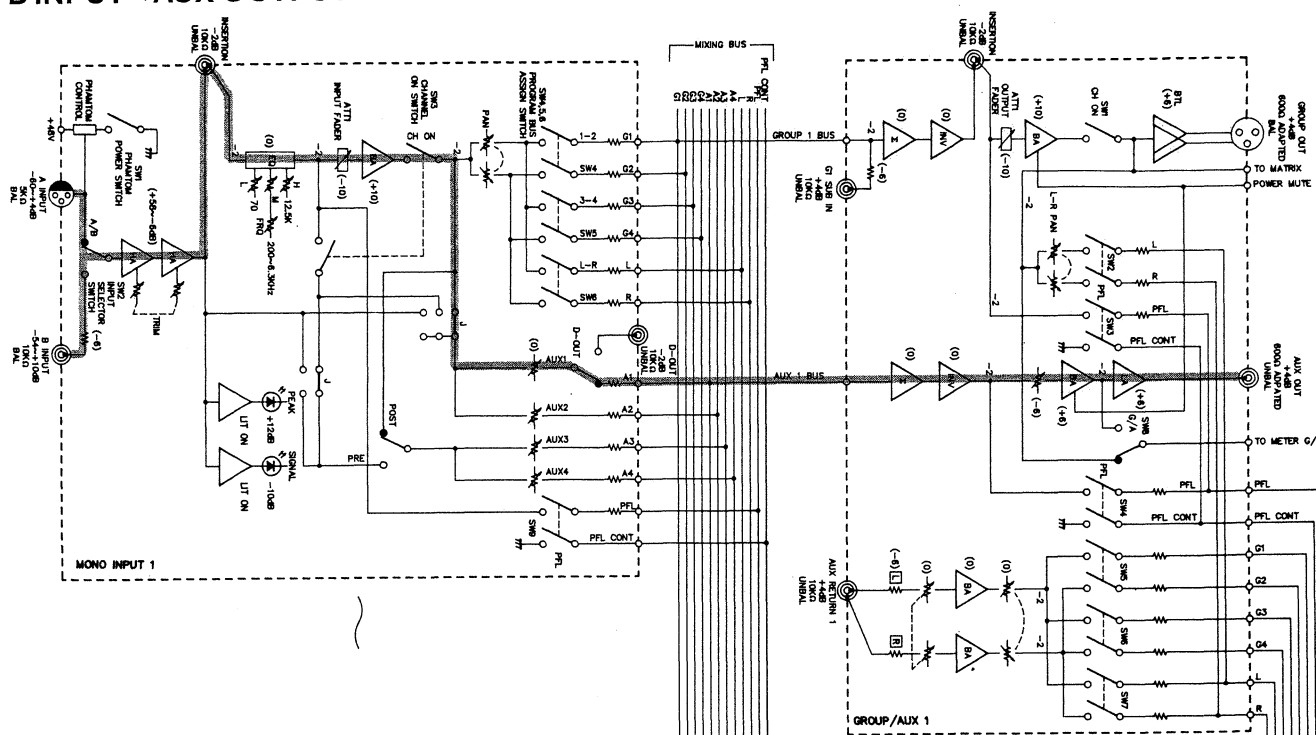
PAN control: At center position
Channel ON Switch: At ON position
Program Bus Assign Switch 1-4: At ON position

■ Group/AUX Section

Group Fader: "0" on Scale
Channel ON Switch: At ON position

- Check that the output levels at Group out are +4 dB with 600 ohms load.
- Check all the A INPUTs and B INPUTs in the same way.

2. A INPUT → AUX OUTPUT B INPUT → AUX OUTPUT



Set the controls and switches on the Mono input section and Group/AUX section as follows.

■ MONO Input Section

Channel ON Switch:

AUX Level control:

At ON position

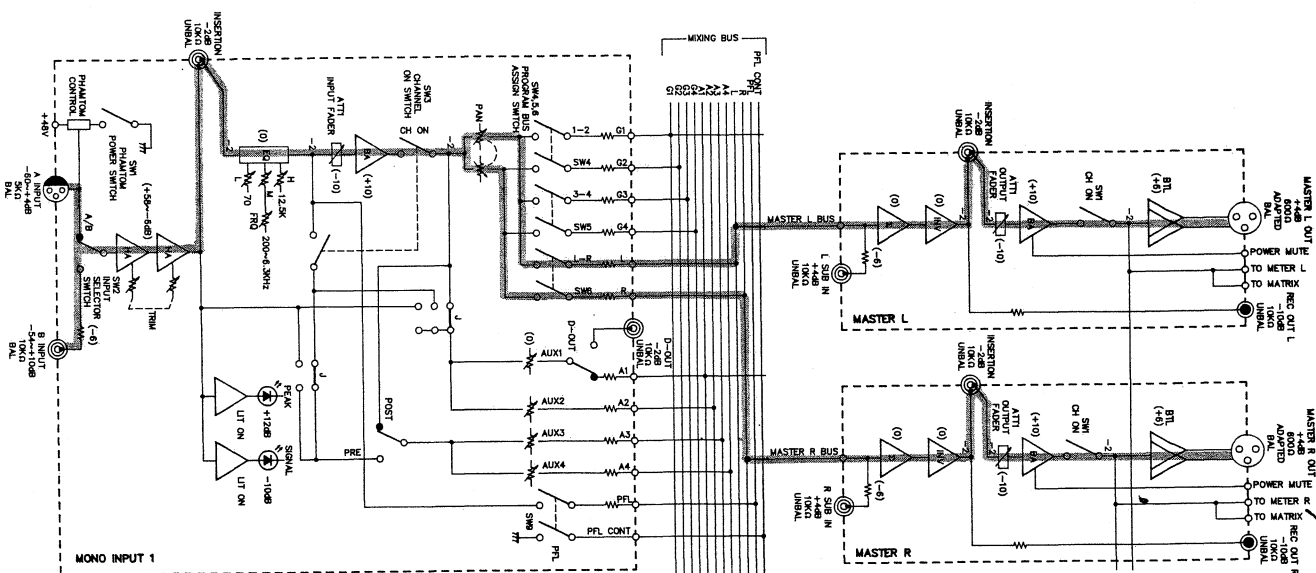
At approximately 3 o'clock position.

■ Group/AUX Section

AUX 1-4 Master Level Control: Nominal level setting

- Check that the output levels at AUX out is +4 dB with 600 ohms load.
- Check all the A INPUTs and B INPUTs.

3. A INPUT → MASTER L/R OUTPUT B INPUT → MASTER L/R OUTPUT



Set the controls and switches on the Mono input section and Master L/R section as follows.

■ MONO Input Section

PAN Control:

Program Bus Assign Switch L/R: At ON position

At center position

■ Master L/R Section

Master Fader:

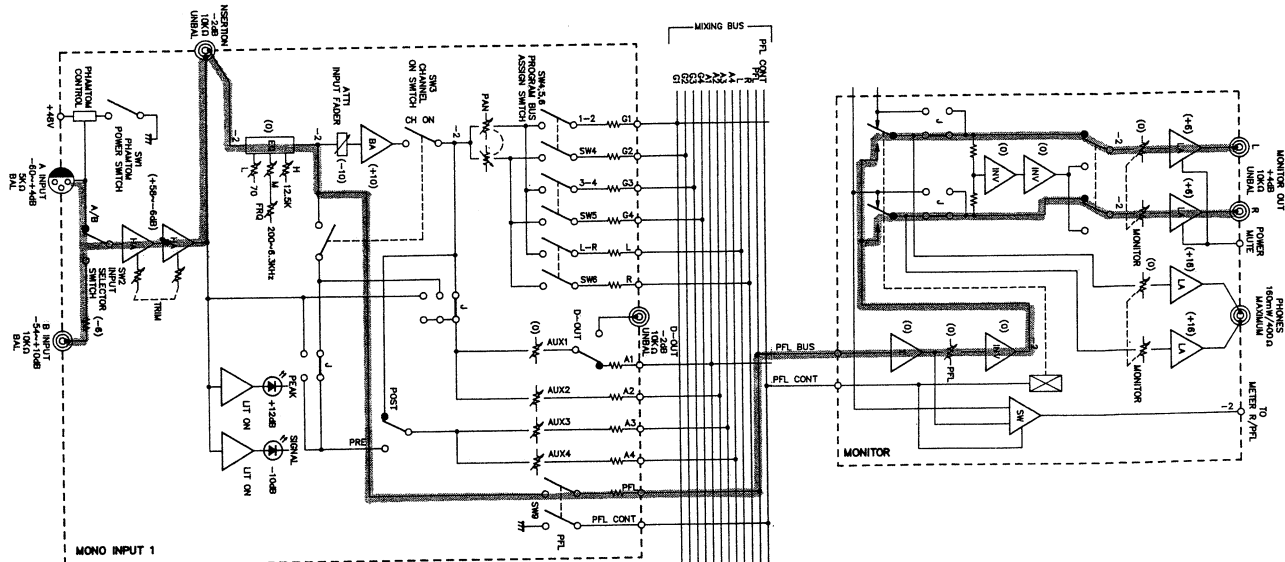
Channel ON Switch:

At "0" on scale

At ON position

- Check that the output levels at Master L/R are +4 dB 600 ohms load.
- Check all the A INPUTs and B INPUTs in the same way.

4. A INPUT → MONITOR OUT (STEREO) B INPUT → MONITOR OUT (STEREO)



Set the controls and switches on the Mono input section and Monitor section as follows.

■ MONO Input Section

PFL Switch:

At ON position

■ Monitor Section

PFL Control:

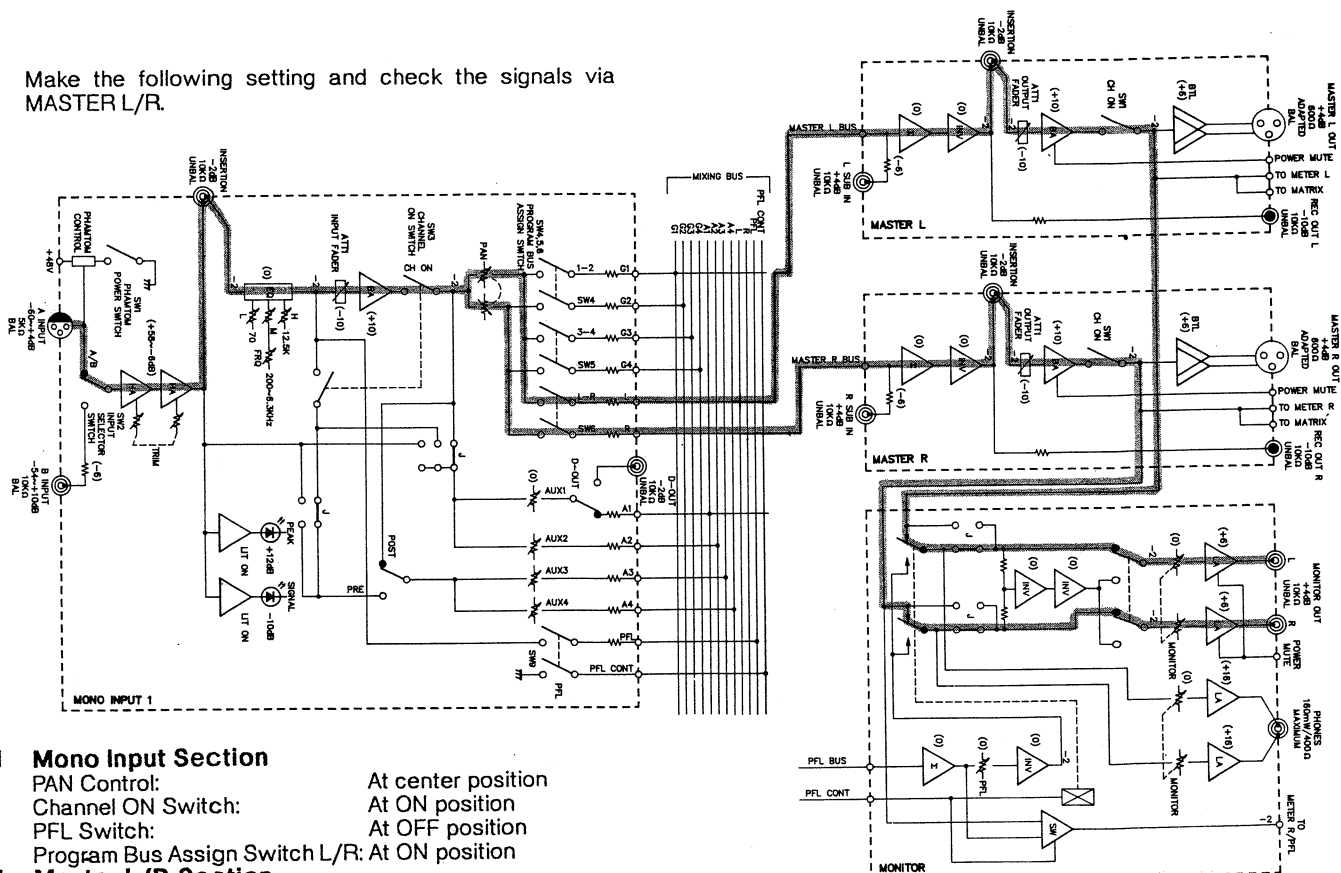
Mono Monitor Switch:

Monitor control:

At approximately 3 o'clock position
At STEREO position
At approximately 3 o'clock position

- Check that the output levels at Monitor out is +4 dB with 10 kohms load.
- Insure "PFL" indicator is lit.
- Check all the A INPUTs and B INPUTs in the same way.

Make the following setting and check the signals via MASTER L/R.



■ Mono Input Section

PAN Control:

At center position

Channel ON Switch:

At ON position

PFL Switch:

At OFF position

Program Bus Assign Switch L/R: At ON position

■ Master L/R Section

Master Fader:

At "0" on scale

Channel ON Switch:

At ON position

■ Monitor section

Mono Monitor Switch:

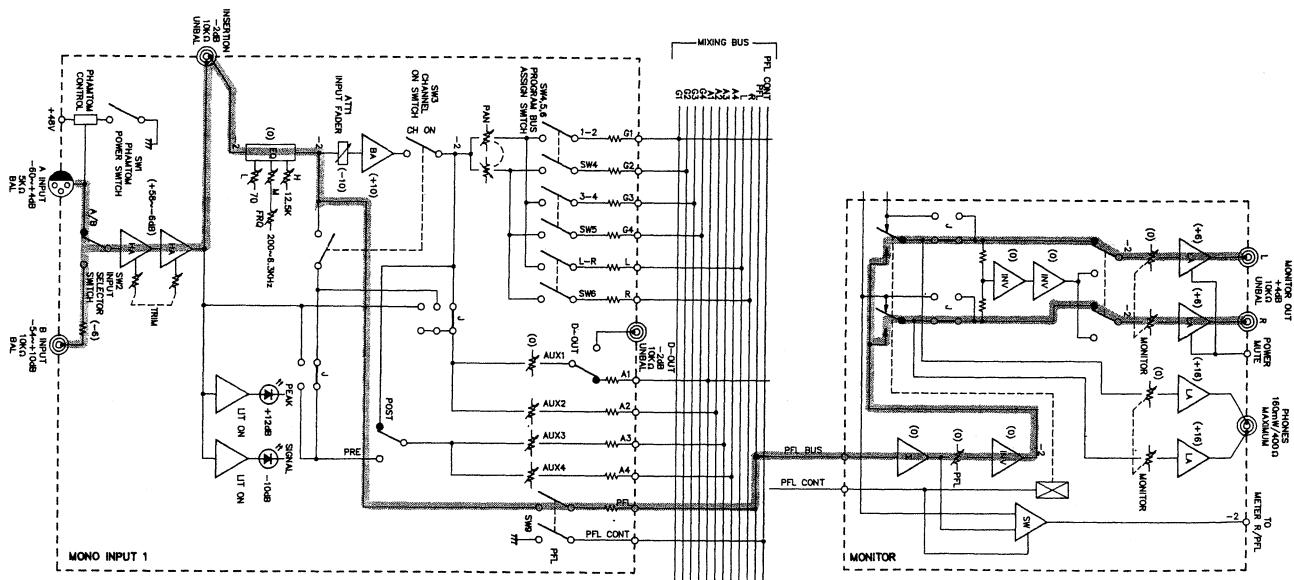
At STEREO position

Monitor Master Level Control:

At "10" on scale

- Check that the output levels at Monitor out L/R are +4 dB with 10 kohms load.
- Check all the A INPUTs and B INPUTs in the same way.

5. A INPUT → MONITOR OUTPUT (MONO) B INPUT → MONITOR OUTPUT (MONO)



Set the controls and switches on the Mono input section and Monitor section as follows.

■ MONO Input Section

PFL Switch: At ON position

■ Monitor Section

PFL control:

At "10" on scale

Mono Monitor Switch:

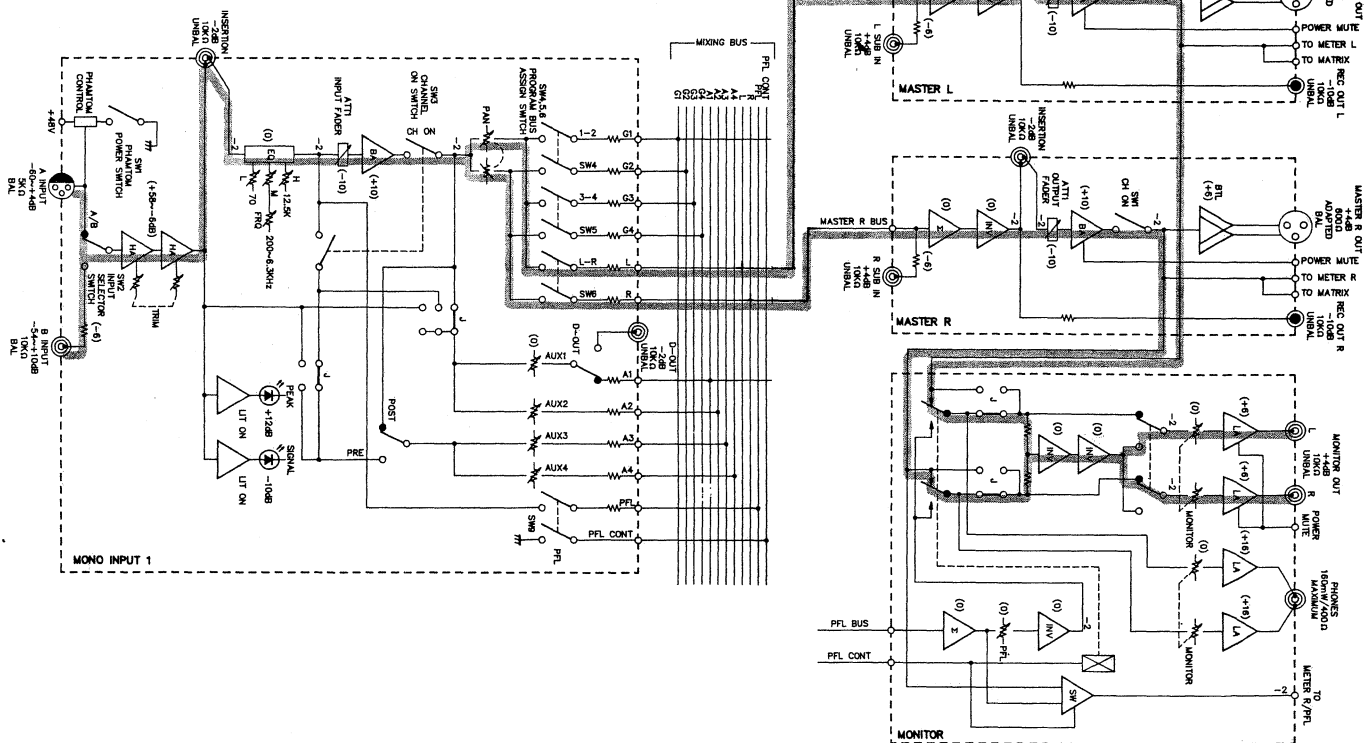
At MONO position

Monitor Master Level Control:

At "10" on scale

- Check that the output levels at Monitor out L/R are +4 dB with 10 kohms load.
- Check all the A INPUTs and B INPUTs in the same way.

- Make the following setting and check the signals via MASTER L/R.



■ Mono Input Section

Channel ON Switch: At ON position
PAN Control: At center position
PFL Switch: At OFF position
Program Bus Assign Switch L/R: At ON position

■ Master L/R Section

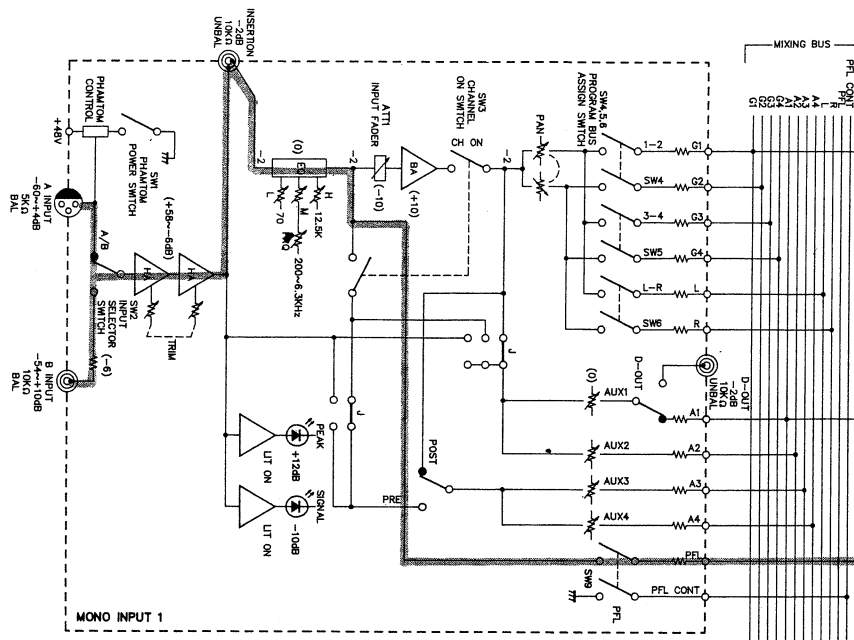
Master Fader: At "0" on scale
Channel ON Switch: At ON position

■ Monitor Section

Mono Monitor Switch: At STEREO position

- Check that the output levels at Monitor out L/R are +4 dB with 10 kohms load.

6. A INPUT → PHONES OUTPUT B INPUT → PHONES OUTPUT



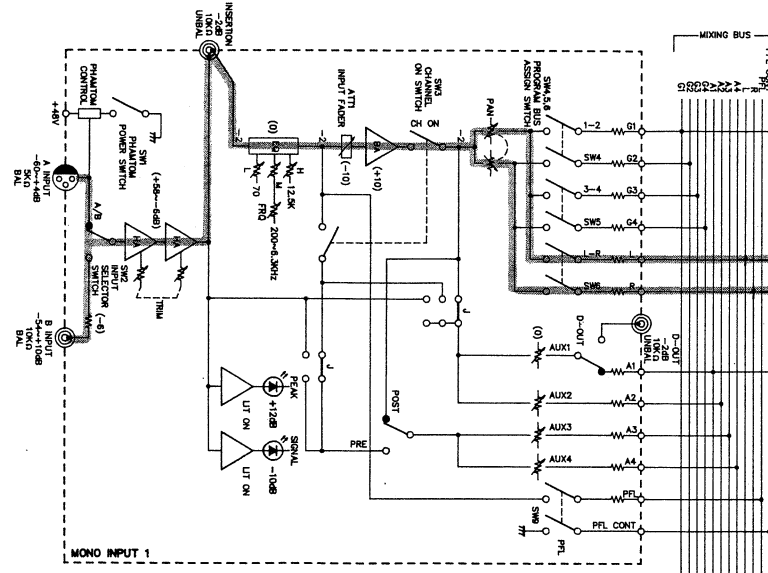
Set the controls and switches on the Mono input section and Monitor section as follows.

■ MONO Input Section

PFL Switch:

At ON position

- Make the following setting and check the signal via MASTER L/R.



■ MONO Input Section

Channel ON Switch:

At ON position

PAN control:

At center position

PFL Switch:

At OFF position

Program Bus Assign Switch L/R: At ON position

■ Master L/R Section

Master Fader:

At "0" on scale

Channel ON Switch:

At ON position

■ Monitor Section

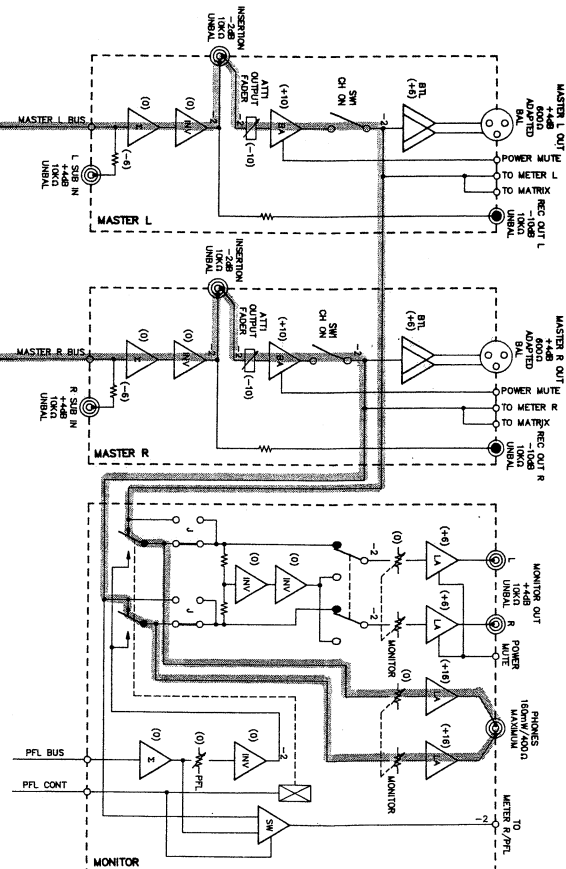
PFL control:

At "10" on scale

PHONES control:

At "10" on scale

- Check that the output levels at Phones out L/R are 160 mW with 400 ohms load.
- Insure "PFL" indicator is lit.
- Check all the A INPUTs and B INPUTs in the same way.



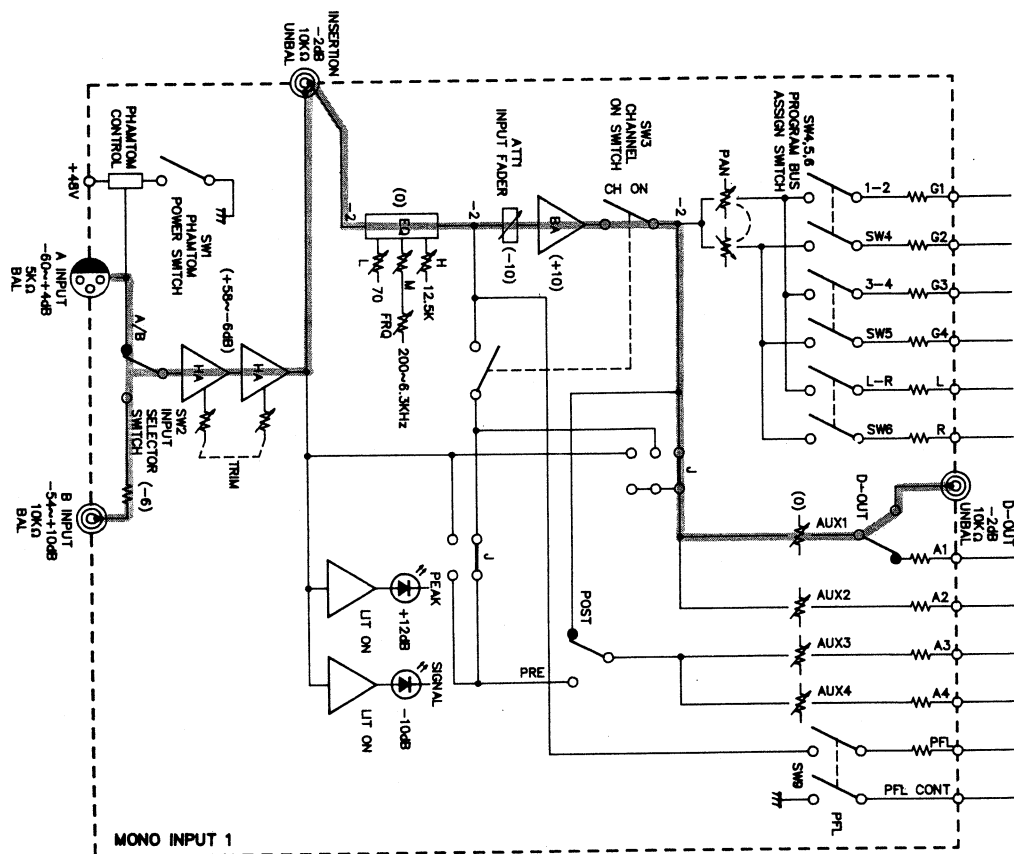
■ Monitor Section

Headphones Level control:

At "10" on scale

- Check that the output levels at Phones out L/R are 160 mW with 400 ohms load.
- Check all the A INPUTs and B INPUTs in the same way.

7. A INPUT→D-OUT B INPUT→D-OUT



Set the controls and switches on the Mono input section as follows.

■ Mono Input Section

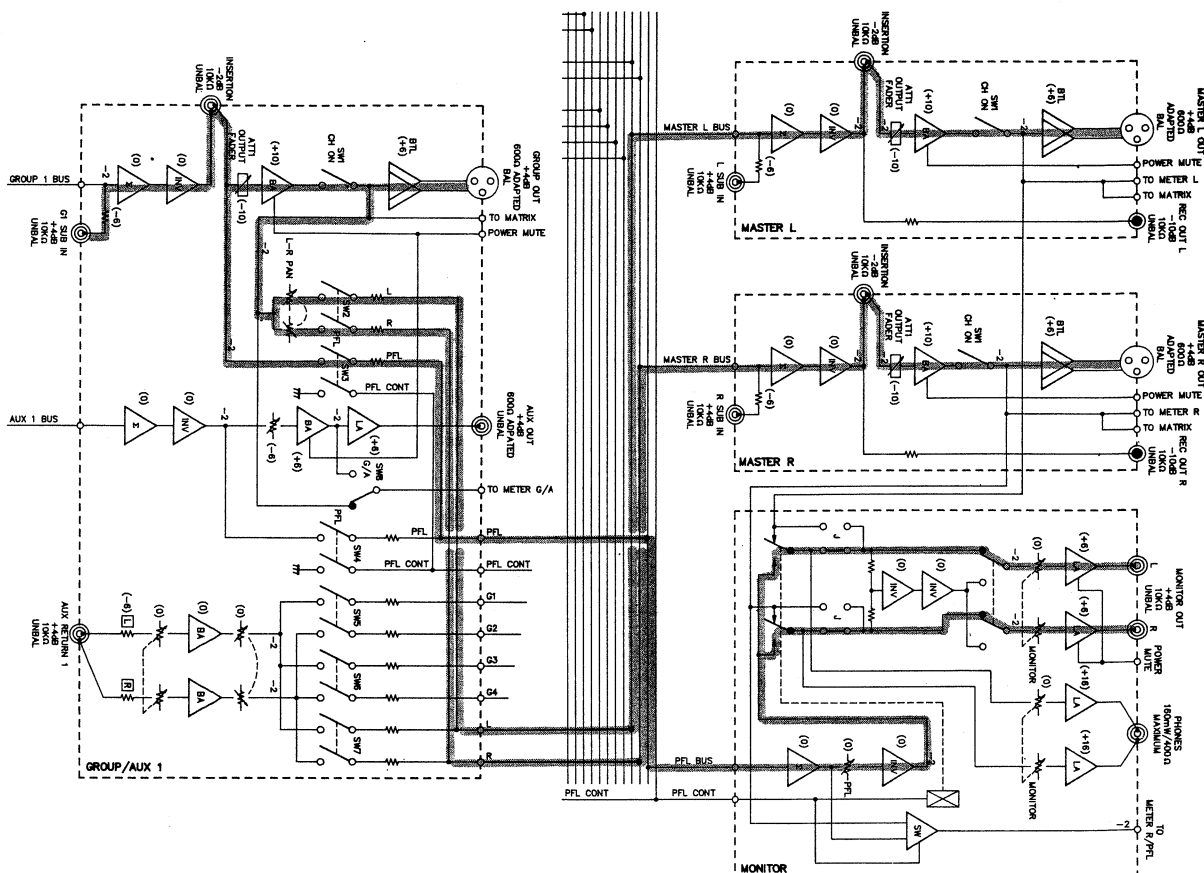
Input fader: At "0" on scale
Channel ON Switch: At ON position
AUX Level control: At approximately 3 o'clock position

DIR Switch: At ON position

- Check that the output levels at D-OUT is -2 dB with 10 kohms load.
- Check all the A INPUTs and B INPUTs in the same way.

8. G1 SUB INPUT → GROUP OUTPUT
 G1 SUB INPUT → MONITOR OUTPUT
 G1 SUB INPUT → MASTER L/R
 G1 SUB INPUT → PHONES OUTPUT

INPUT	LEVEL
G1 SUB INPUT	1 kHz +4 dB 10 kohms



Set the controls and switches on the GROUP/AUX section as follows.

■ Group/AUX Section

- Group fader: At "0" on scale
- Channel ON Switch: At ON position
- Check that the output levels at Group out is +4 dB with 600 ohms load.

Set the controls and switches on the Group/AUX section and Monitor section as follows.

■ Monitor Section

- PFL Switch: At ON position
- Mono Monitor Switch: At STEREO position
- Monitor Master Level control: At "10" on scale
- Check that the output levels at Monitor L/R out are +4 dB with 10 kohms load.
- Insure "PFL" indicator is lit.

Set the controls and switches on the Group/AUX section and Master L/R section as follows.

■ Group/AUX Section

- Group fader: At "0" on scale
- Channel ON Switch: At ON position
- L-R Switch: At ON position
- PAN Control: At center position
- PFL Switch: At ON position

■ Master L/R Section

- Master fader: At "0" on scale
- Channel ON Switch: At ON position

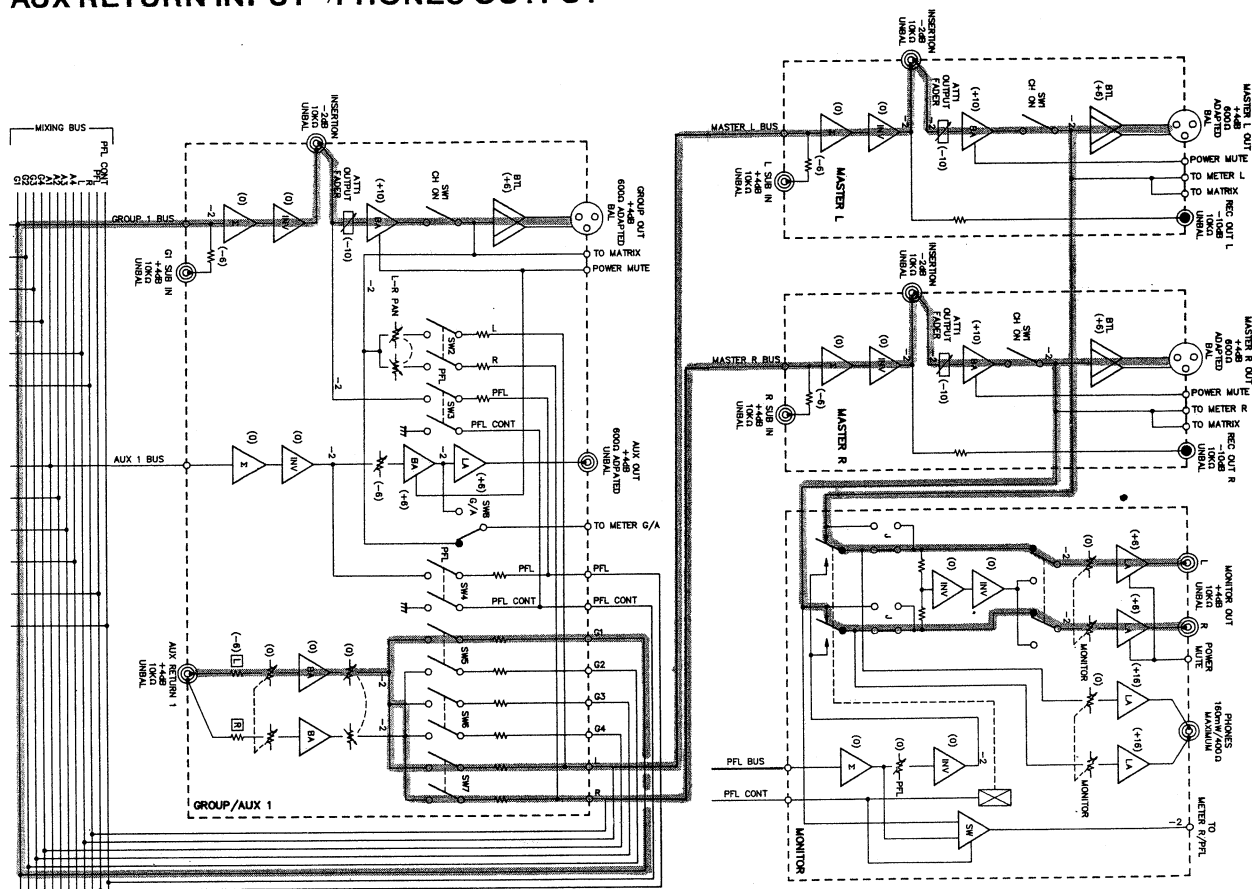
- Check that the output levels at Master L/R out are +4 dB with 600 ohms load.

Set the controls and switches on the Group/AUX section and Monitor section as follows.

■ Monitor Section

- PFL control: At "10" on scale
- Headphones Level control: At "10" on scale
- Check that the output levels at Phones L/R are 160 mW with 400 ohms load.
- Insure "PFL" indicator is lit.

9. AUX RETURN INPUT → GROUP OUTPUT
AUX RETURN INPUT → MASTER L/R OUTPUT
AUX RETURN INPUT → MONITOR OUTPUT
AUX RETURN INPUT → PHONES OUTPUT



Set the controls and switches on the Group/AUX section as follows.

Control/Switch	Setting	Input	Level
Level Control	At nominal position	AUX Return Input	1 kHz +4 dB
Balance Control	At center position		
Group fader	At "0" on scale		
Channel ON Switch	At ON position		

■ Group/AUX Section

- Program Bus Assign Switch 1-4: At ON position
- Check that the output levels at Group1-4 out are +4 dB with 600 ohms load.

Set the control and switches on the Group/AUX section and Master L/R section as follows.

■ Group/AUX Section

- Program Bus Assign Switch 1-4: At OFF position
- Program Bus Assign Switch L/R: At ON position

■ Master L/R Section

- Master fader: At "0" on scale
- Channel ON Switch: At ON position
- Check that the output levels at Master L/R out is +4 dB with 600 ohms load.

Set the controls and switches on the Group/AUX section and Master L/R section as follows.

■ Group/AUX Section

- Program Bus Assign Switch 1-4: At OFF position
- Program Bus Assign Switch L/R: At ON position

■ Master L/R Section

- Master fader: At "0" on scale
- Channel ON Switch: At ON position
- Mono Monitor Switch: At STEREO position
- Monitor Master Level control: At "10" on scale

- Check that the output levels at Monitor L/R out is +4 dB with 10 kohms load.

Set the controls and switches on the Group/AUX section and Master L/R section as follows.

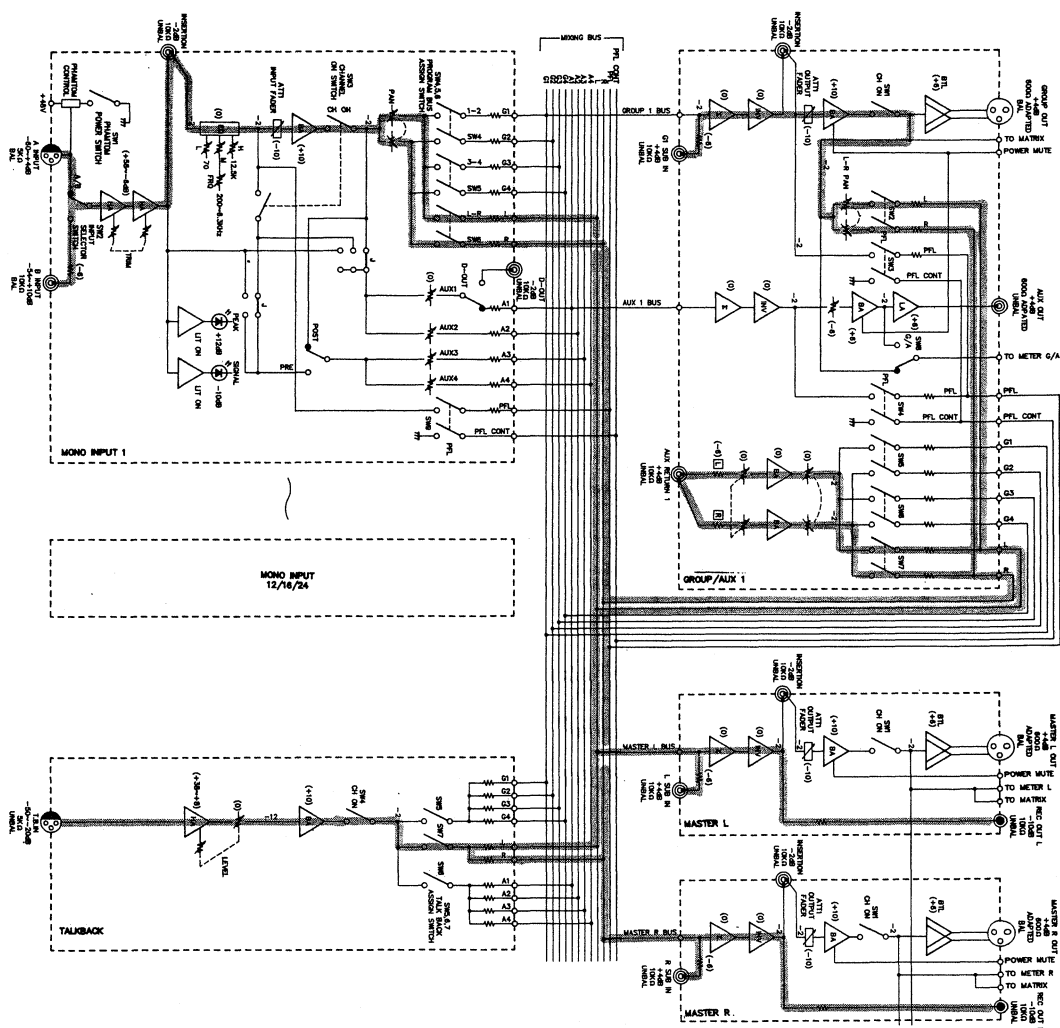
■ Group/AUX Section

- Program Bus Assign Switch 1-4: At OFF position
- Program Bus Assign Switch L/R: At ON position

■ Master L/R Section

- Master fader: At "0" on scale
- Channel ON Switch: At ON position
- Headphones Level control: At "10" on scale
- Check that the output levels at Phones L/R out is 160 mW with 400 ohms load.

10. A INPUT→REC OUT L/R
 B INPUT→REC OUT L/R
 G1 SUB INPUT→REC OUT L/R
 L/R SUB INPUT→REC OUT L/R
 AUX RETURN INPUT→REC OUT L/R
 T.B.INPUT→REC OUT L/R



Set the controls and switches on the Mono input section as follows.

■ Mono Input Section

- Input fader: At "0" on scale
 Channel ON Switch: At ON position
 PAN control: At center position
 Program Bus Assign Switch L/R: At ON position
- Check that the output levels at REC out is -10 dBV with 10 kohms load.

* 0 dB is referenced to 1 Vrms.

Set the controls and switches on the Group/AUX section as follows.

■ Group/AUX Section

- Group fader: At "0" on scale
 Channel ON Switch: At ON position
 PAN control: At center position
 Program Bus Assign Switch L/R: At ON position
- Input the signal set at 1 kHz, +4 dB with 10 kohms load to G1 Sub input.
 - Check that the output level at REC OUT L/R is -10 dBV with 10 kohms load.
 - Input the signal set at 1 kHz, +4 dB with 10 kohms load to L/R SUB INPUT.
 - Check that the output level at REC OUT L/R is -10 dBV with 10 kohms load.

Set the controls and switches on the GROUP/AUX section as follows.

■ Group/AUX Section

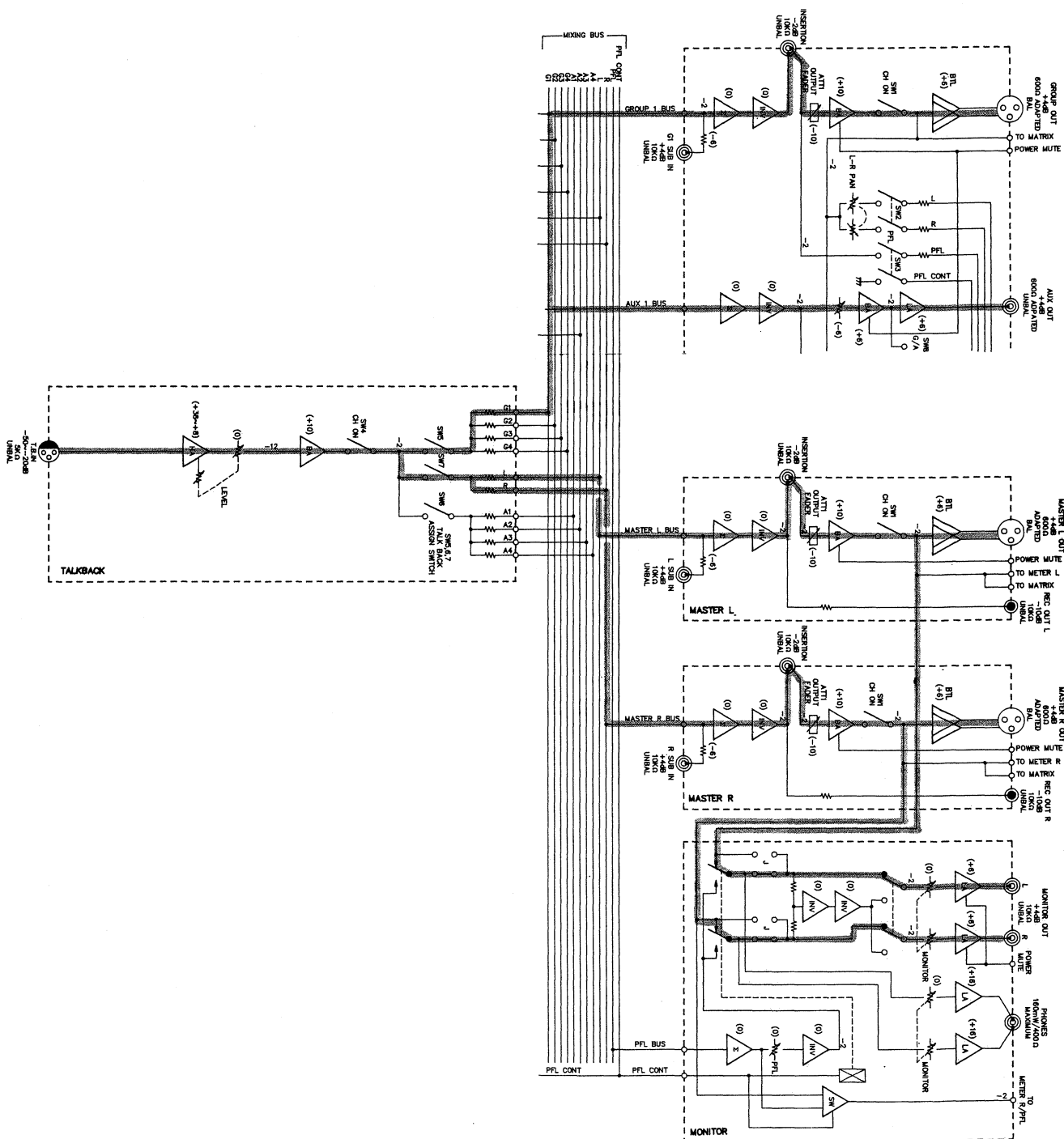
- AUX Return Input control: At "10" on scale
 Balance control: At center position
 Program Bus Assign Switch L/R: At ON position
- Input the signal set at 1 kHz, +4 dB to AUX RETURN INPUT.
 - Check that the output level at REC OUT L/R is -10 dBV with 10 kohms load.

Set the control and switch on the Talkback section as follows.

■ Talkback Section

- Talkback Level control: At "10" on scale
 Channel ON Switch: At ON position
- Input the signal set at 1 kHz, -50 dB.
 - Check that the output level at REC OUT L/R is -10 dBV with 10 kohms load.

- 11. T.B.MIC INPUT→GROUP OUTPUT
- T.B.MIC INPUT→MASTER OUT L/R
- T.B.MIC INPUT→PHONES OUTPUT
- T.B.MIC INPUT→MONITOR OUTPUT
- T.B.MIC INPUT→AUX OUTPUT



TALKBACK Section		
Control/Switch	Setting	Input level
SW4(T.B.)	ON	1 kHz – 50 dB
Talkback Level control	At "10" on scale	

Set the controls and switches on the Talkback section and Group /AUX section as follows.

■ **Talkback section**

Talkback Assign Switch G1-G4: At ON position

■ **Group/AUX Section**

Group fader: At "0" on scale

Channel ON Switch: At ON position

- Check that the output levels at Group out are +4 dB with 600 ohms load.

Set the controls and switches on the Talkback section and Master L/R section as follows.

■ **Talkback Section**

Talkback Assign Switch L/R: At ON position

■ **Master L/R Section**

Master fader: At "0" on scale

Channel ON Switch: At ON position

- Check that the output levels at Master out L/R are +4 dB with 600 ohms load.

Set the controls and switches on the Talkback section, Master L/R section and Monitor section as follows.

■ **Talkback Section**

Talkback Assign Switch L/R: At ON position

■ **Master L/R Section**

Master fader: At "0" on scale

Channel ON Switch: At ON position

■ **Monitor Section**

Headphones Level control: At "10" on scale

- Check that the output levels at Phones out L/R are 160 mW with 400 ohms load.

Set the controls and switches on the Talkback section, Master L/R section and Monitor section as follows.

■ **Talkback Section**

Talkback Assign Switch L/R: At ON position

■ **Master L/R Section**

Master fader: At "0" on scale

Channel ON Switch: At ON position

■ **Monitor Section**

Mono Monitor Switch: At STEREO position

Monitor Master Level Control: At "10" on scale

- Check that the output levels at Monitor out L/R are +4 dB with 10 kohms load.

Set the controls and switches on the Talkback section and Group/AUX section as follows.

■ **Talkback Section**

Talkback Assign Switch A1-A4: At ON position

■ **Group/AUX Section**

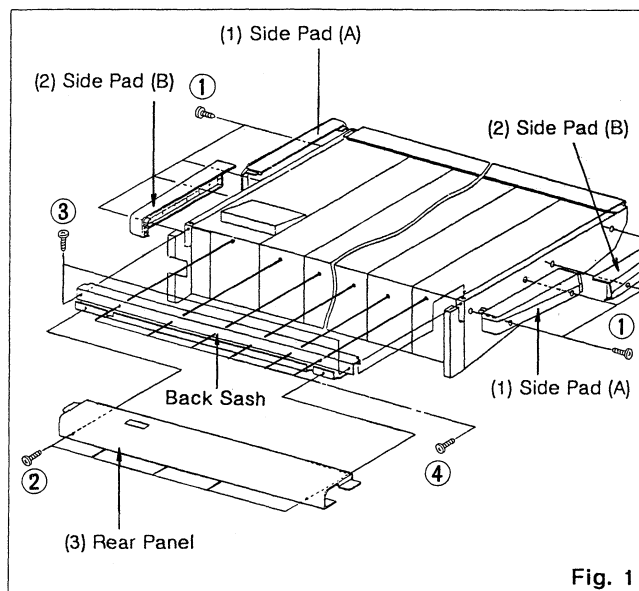
AUX 1-4 controls: At nominal position

- Check that the output levels at AUX out +4 dB with 600 ohms load.

DISASSEMBLY

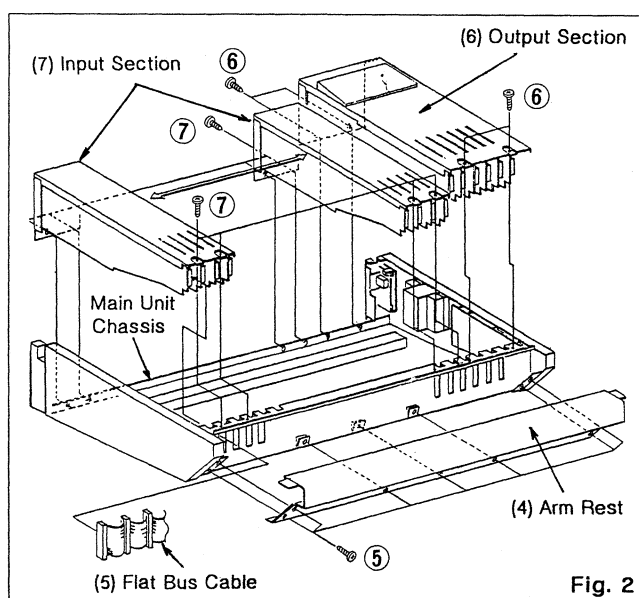
Rear Panel & Side Pad Removal for WR-S4424

- Remove eight screws ① holding the side pads (A), (B); (1), (2) on the left and right.
- Remove five screws ② holding the rear panel (3) then remove the rear panel from the back sash. Then, remove two types of each screws ③, ④ holding the back sash then remove the back sash from the main unit.



Input/Output Sections & Palm Rest Removal for WR-S4424

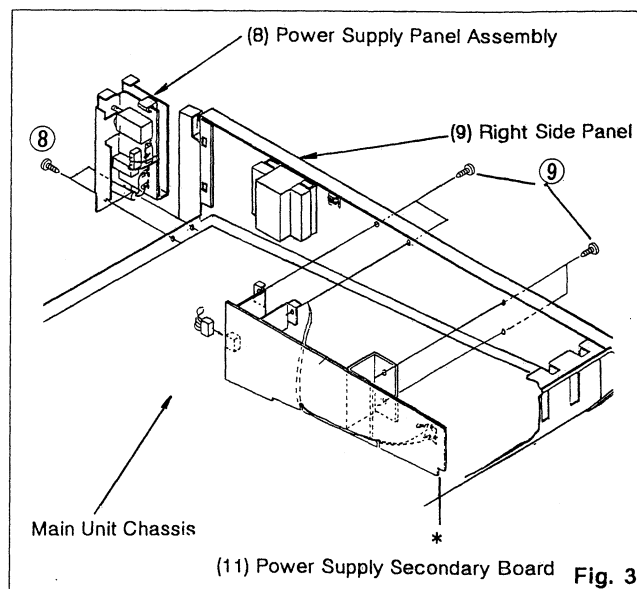
- Remove seven screws ⑤ holding the palm rest (4) then remove the palm rest from the main unit.
- Remove the bus cable (5) from each board.
- Remove four screws ⑥ holding the output section (6) then lift up the output section to remove the whole assembly.



- To remove input modules, remove four screws ⑦ per module, then lift the module out of the chassis.

Power Unit Removal

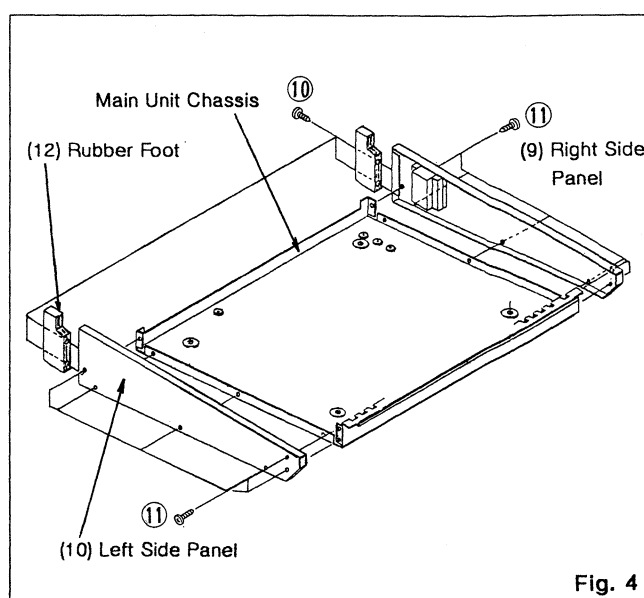
- Remove two screws ⑧ holding the power supply panel assembly (8) then remove the assembly.
- Remove four screws ⑨ holding the right side panel (9) then remove the power supply secondary board (11).
- Then, disconnect each connector and remove each lead. (Fig. 3)



- * On assembly, the front end of the board should be inserted in the cut off portion of the main unit chassis.

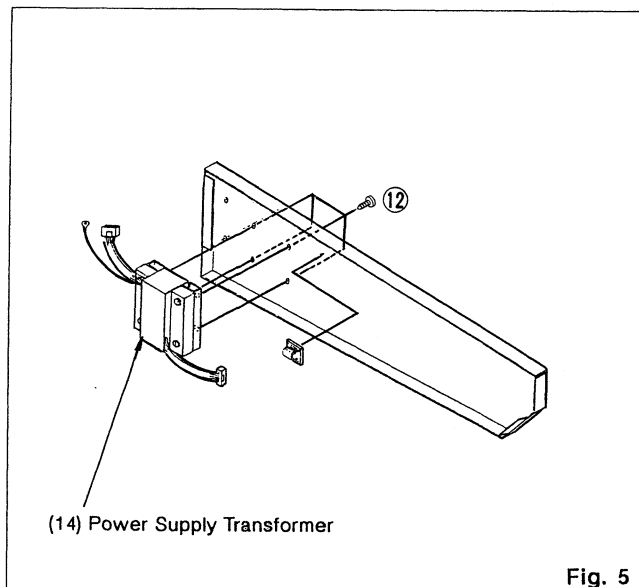
Disassembling the Main Unit

- Remove two screws ⑩ from each rubber foot 12.
- Remove six screws ⑪ holding each the left and right side panel (9), (10).



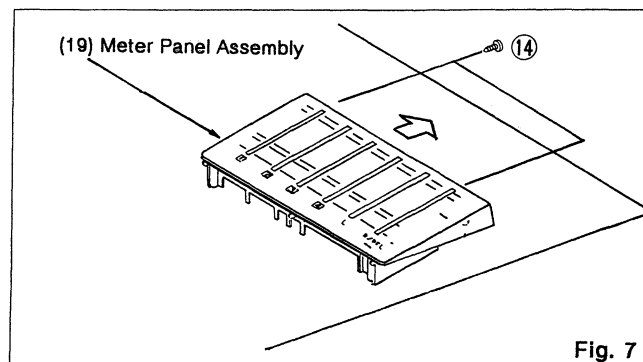
Power Transformer Removal

- Remove four screws (12) holding the power transformer then remove the power transformer.



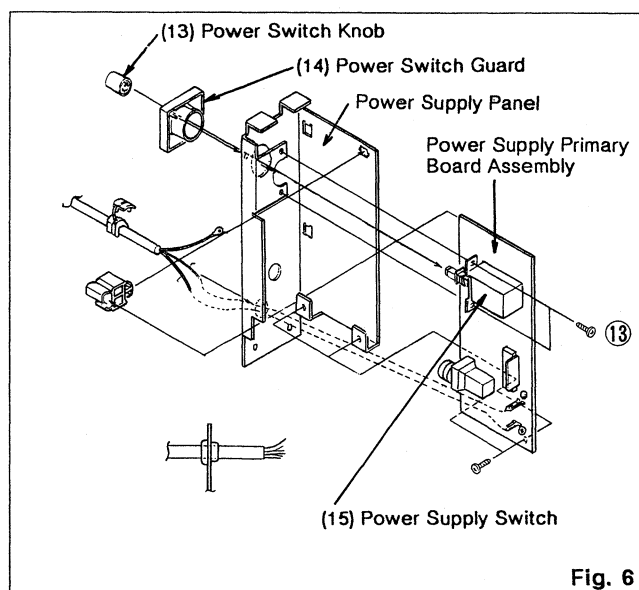
Meter Panel Assembly Removal

- Remove two screws (14) holding the meter panel assembly (14) then slide in direction of the arrow.



Power Supply Panel Assembly Removal

- Pull out the power switch knob 13 and the power switch guard 14.
- Remove two screws (13) holding each the power supply switch 15 and the power supply primary board assembly. Then pull out the board.



ADJUSTMENT

LED BARGRAPH METER ADJUSTMENT

Adjustment Preparation

Remove the two screws on rear of meter panel (see Meter Panel Assembly Removal, page 20, fig. 7).
Set the meter panel on top of its opening so that the adjustment trim pots are exposed. Be sure that the circuit board does not contact any metal points on the chassis.

Adjustment Procedure

1. Apply a +4 dBu, 1 kHz sine wave to any input channel.
2. Set controls as follows:
Input Channel section
 Input level - minimum (fully counterclockwise)
 EQ - flat(center detent position)
 Assign switches 1/2, 3/4, L/R - on
 Fader - flat(center detant position)
 Channel On switch - on
 Pan control - center detent
 PFL switch - off

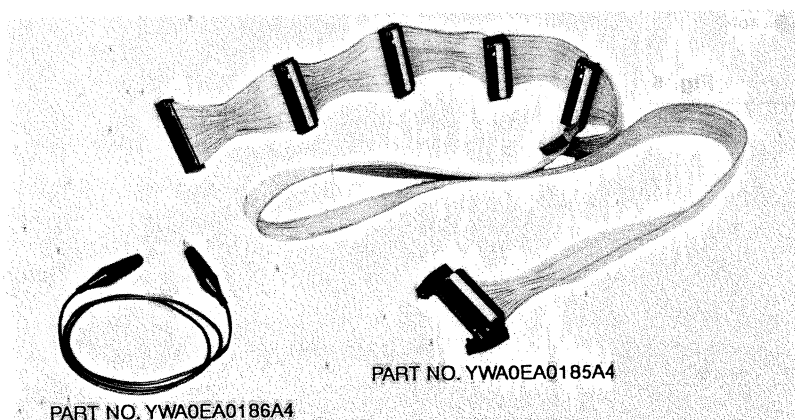
Group/Aux Output Section
 G1 - G4, L & R Faders - "0" position
 ON switches - on
 L-R switches - off
 Pan controls - center detent
 PFL switches - off
 Meter select switches - out (G1 - G4)
3. Readjust the Input Level control so that all meters are reading approximately "0".
4. Measure each output, G1 - G4, L and R. Adjust each respective fader so that all outputs are exactly +4 dBu with 10K ohms termination.
5. Adjust VR1 so that the green LED at the "0" point of the G1 meter just becomes brightly lit.
6. Adjust the remaining meters the same way (VR2 for G2, VR3 for G3, VR4 for G4, VR5 for L, VR6 for R).

NOTE:

Use an insulated screwdriver to prevent false readings.

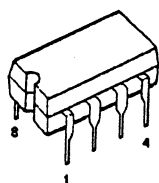
Extension Cable

- A. Extension cable is available for testing modules outside of the mainframe.
 - The extension cable (YWA0EA0186A4, YWA0EA0185A4) consists of connection boards and extension cables, which facilitates troubleshooting in the event of a problem with any of the modules.

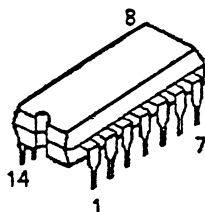


APPEARANCE OF IC TRANSISTOR AND DIODE

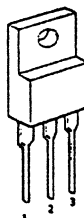
- YWNJM2068DD
- YWNJM4556DD
- YWNJM4558DD



- YWUPD6360C



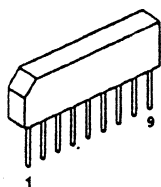
- YWNJM7812FA
- 2SD1276A-QR
- 2SB943-PQ
- 2SD1268-PQ



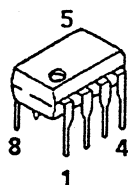
- 2SC1844-FE
- 2SC1684-QR
- 2SA564-RS
- 2SC1318-RS



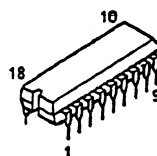
- YWTA7317P



- YWM5201P



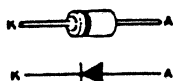
- AN6891



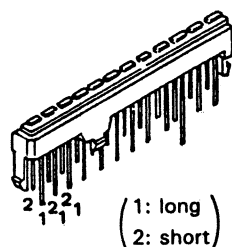
- 2SK301-R



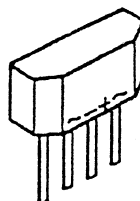
- MA165
- MA167
- YWHZS16EB2
- YWAM01Z
- YWHZS27EB2



- LN121185P



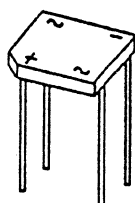
- YWRB152F



- LN021582PH



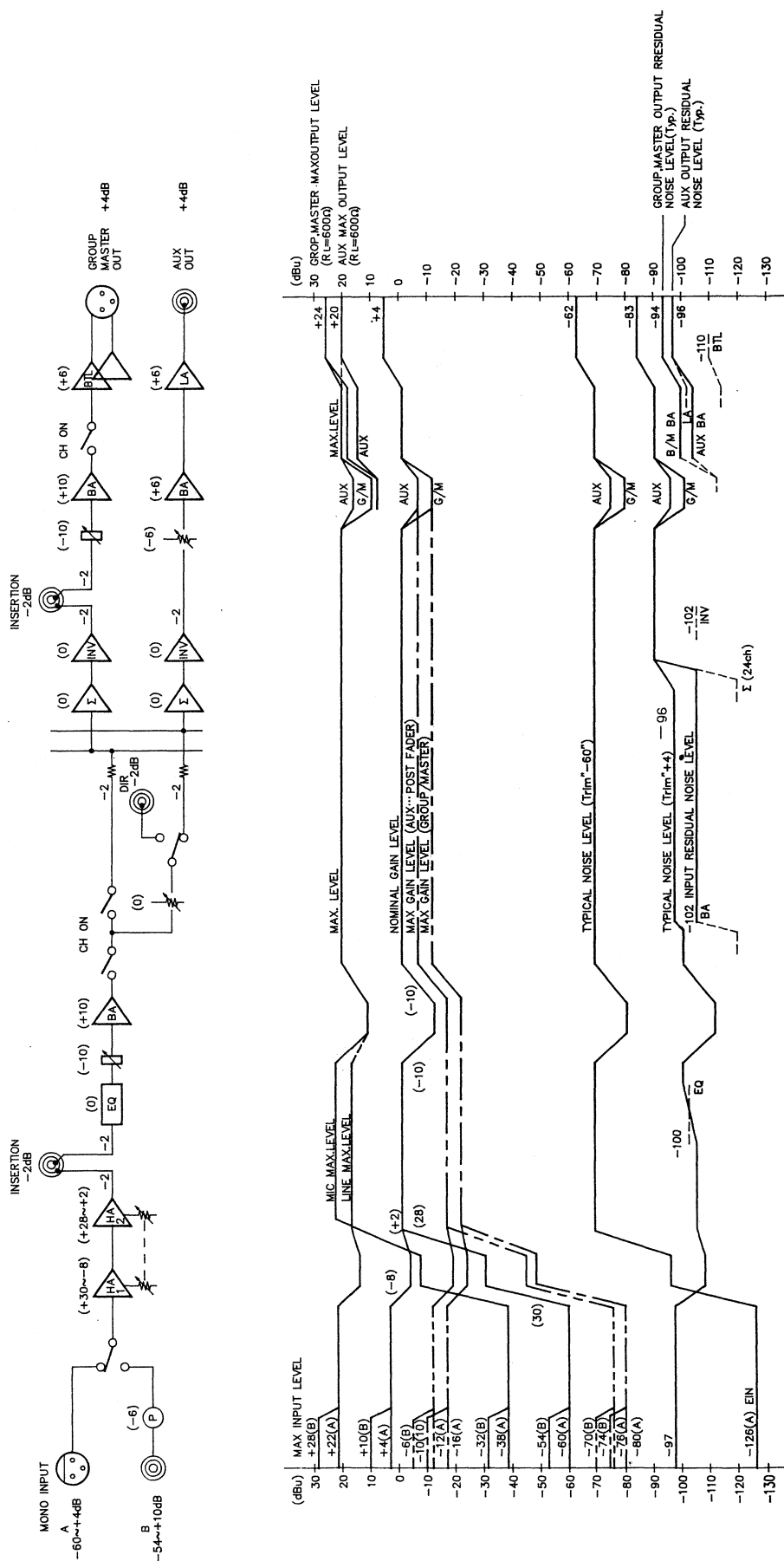
- YWRB402F

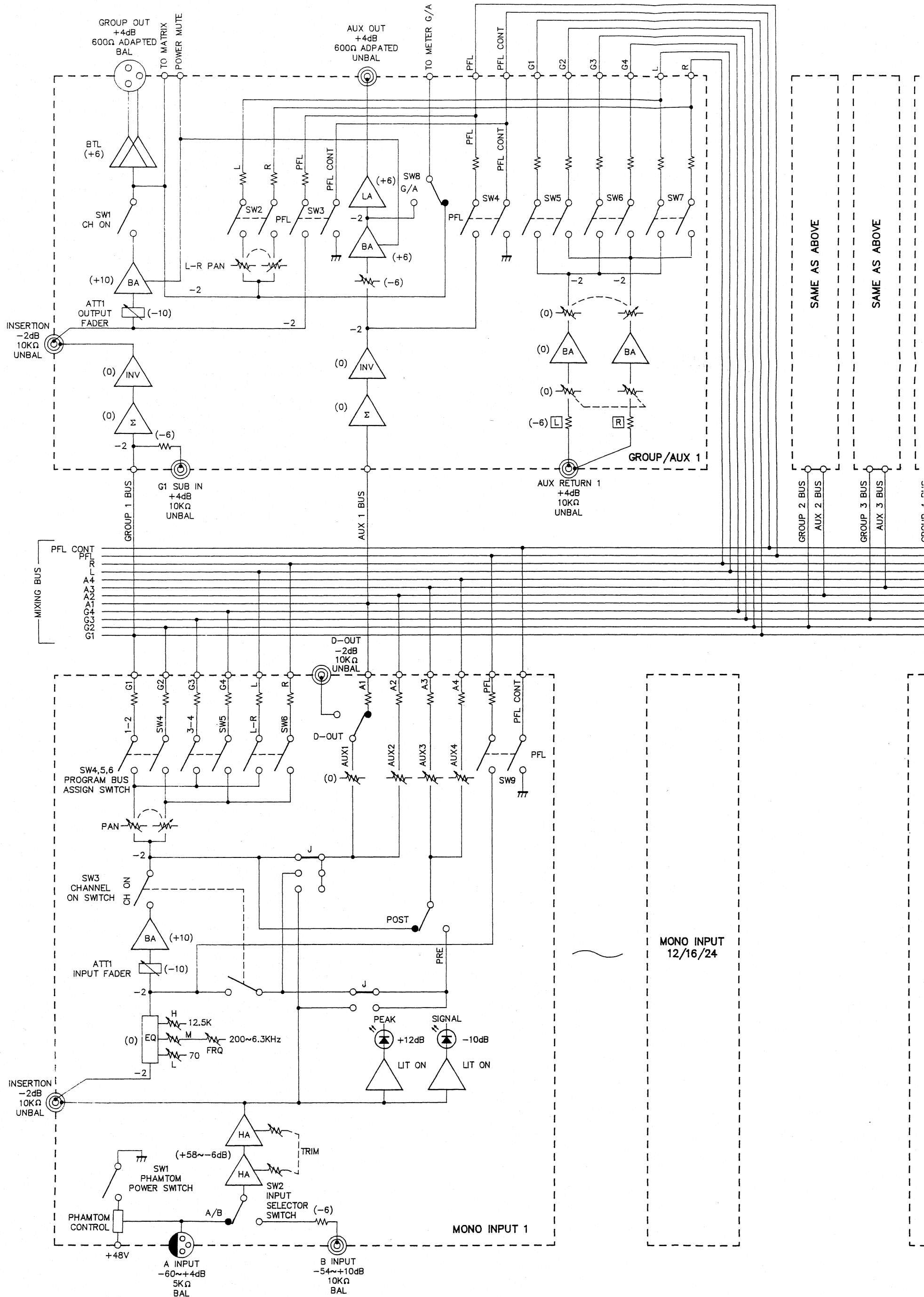


- LN220RP

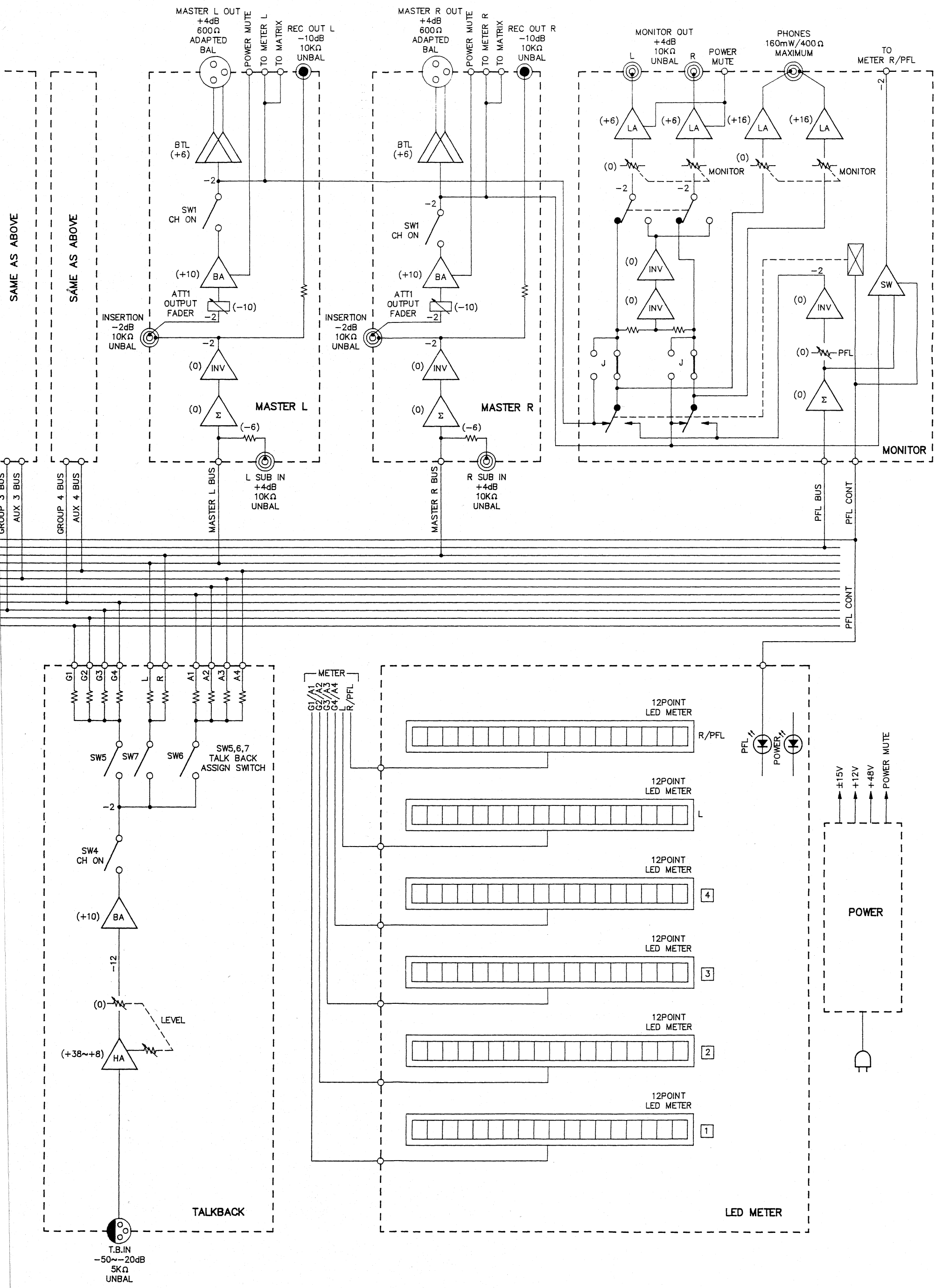


LEVEL DIAGRAM





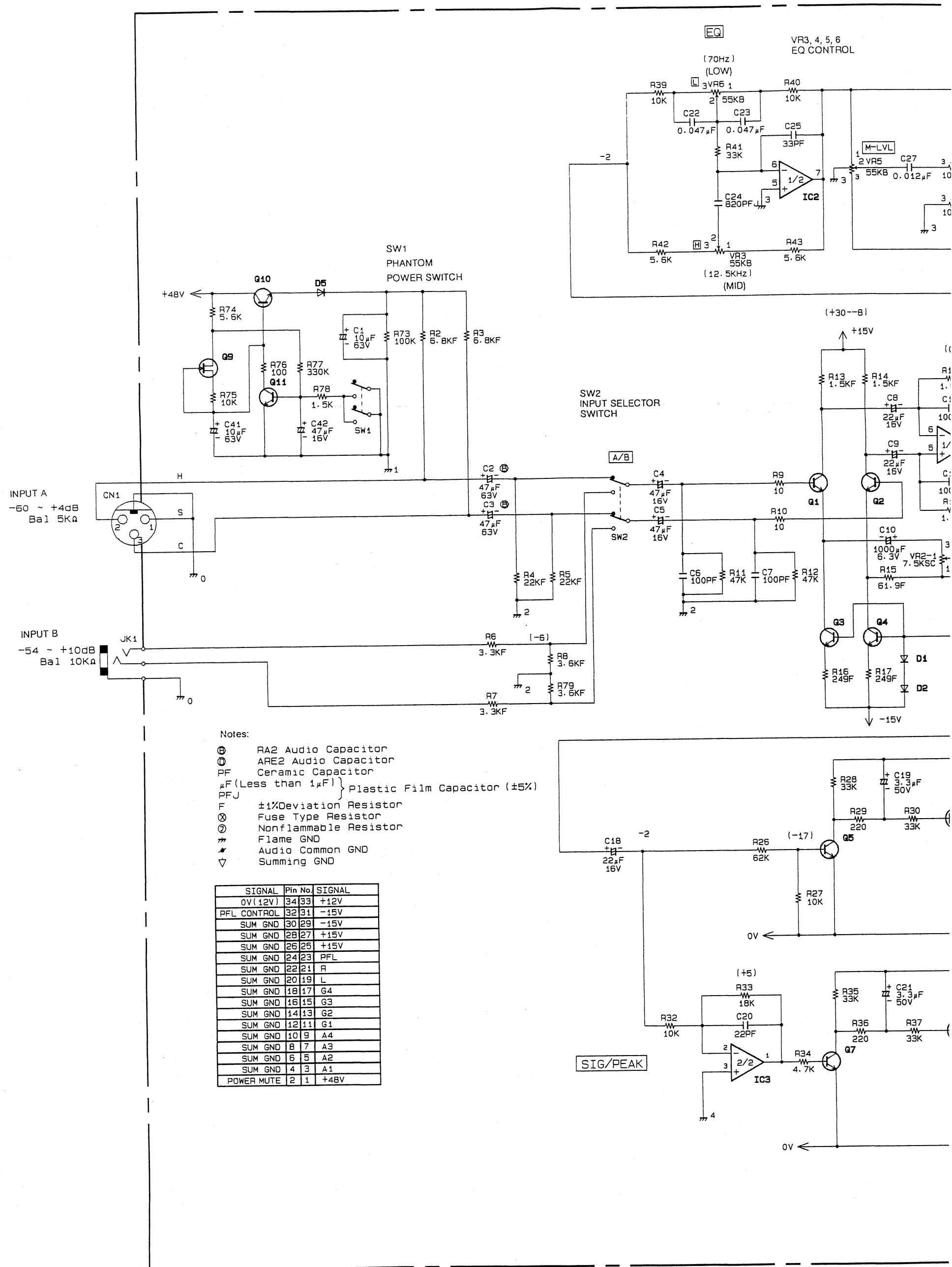
DIAGRAM



C

B

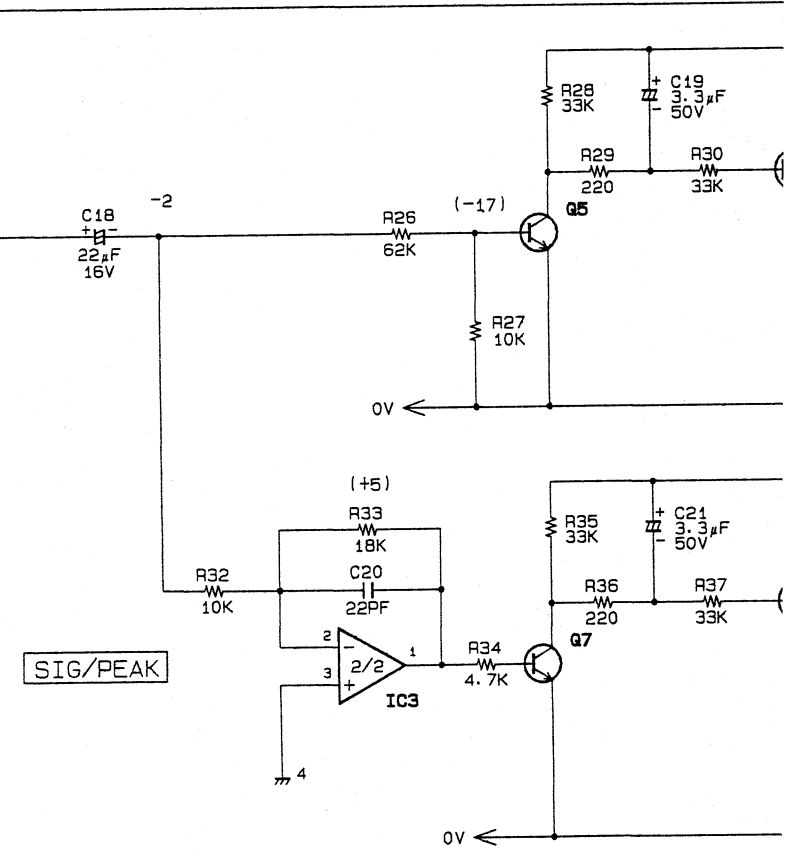
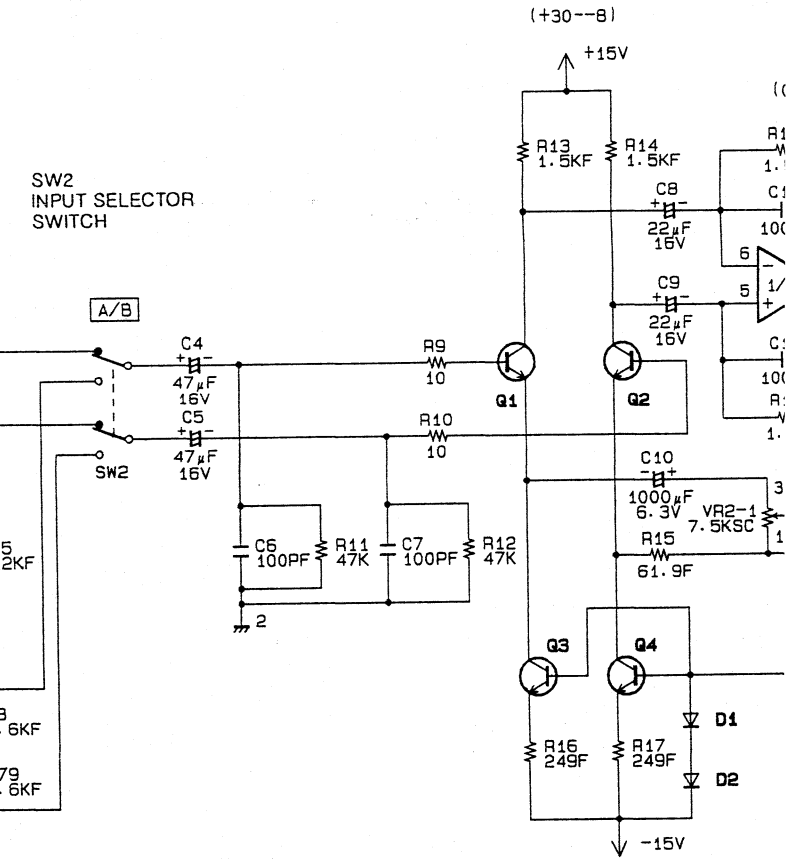
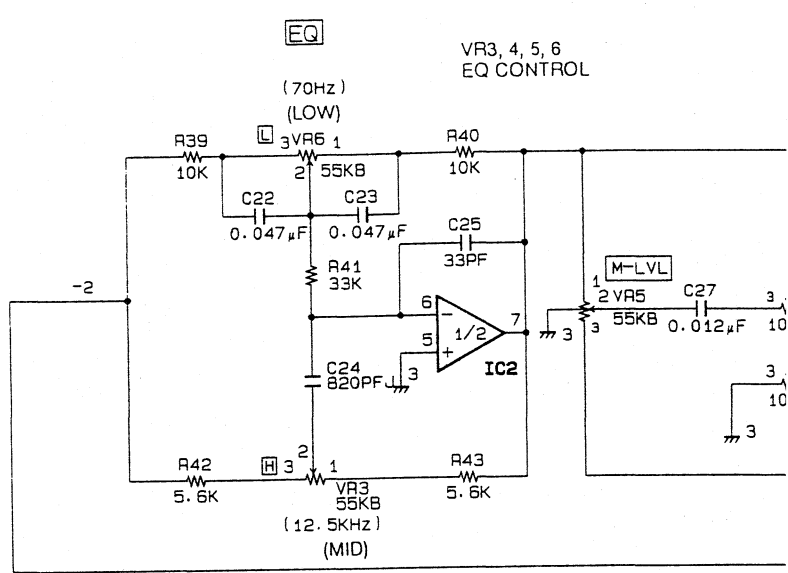
A



Notes:

- ⊕ RA2 Audio Capacitor
- ⊙ ARE2 Audio Capacitor
- PF Ceramic Capacitor
- μF (Less than 1μF) Plastic Film Capacitor (±5%)
- PFJ ±1% Deviation Resistor
- ⊗ Fuse Type Resistor
- ⊙ Nonflammable Resistor
- ⊕ Flame GND
- ⊕ Audio Common GND
- ⊕ Summing GND

SIGNAL	Pin No.	SIGNAL
0V (12V)	34/33	+12V
PFL CONTROL	32/31	-15V
SUM GND	30/29	-15V
SUM GND	28/27	+15V
SUM GND	26/25	+15V
SUM GND	24/23	PFL
SUM GND	22/21	R
SUM GND	20/19	L
SUM GND	18/17	G4
SUM GND	16/15	G3
SUM GND	14/13	G2
SUM GND	12/11	G1
SUM GND	10/9	A4
SUM GND	8/7	A3
SUM GND	6/5	A2
SUM GND	4/3	A1
POWER MUTE	2/1	+48V



<Grid Key>

IC1	C2, A3	Q5	B2
IC2	D2, A3	Q6	B2
IC3	D3, A3	Q7	B1
Q1	C2	Q8	B1
Q2	C2	Q9	C1
Q3	B2	Q10	C1
Q4	B2	Q11	C1

1

Switch No.	FUNCTION
SW1	Phantom Power SW
SW2	Input selector SW
SW3	Channel ON SW

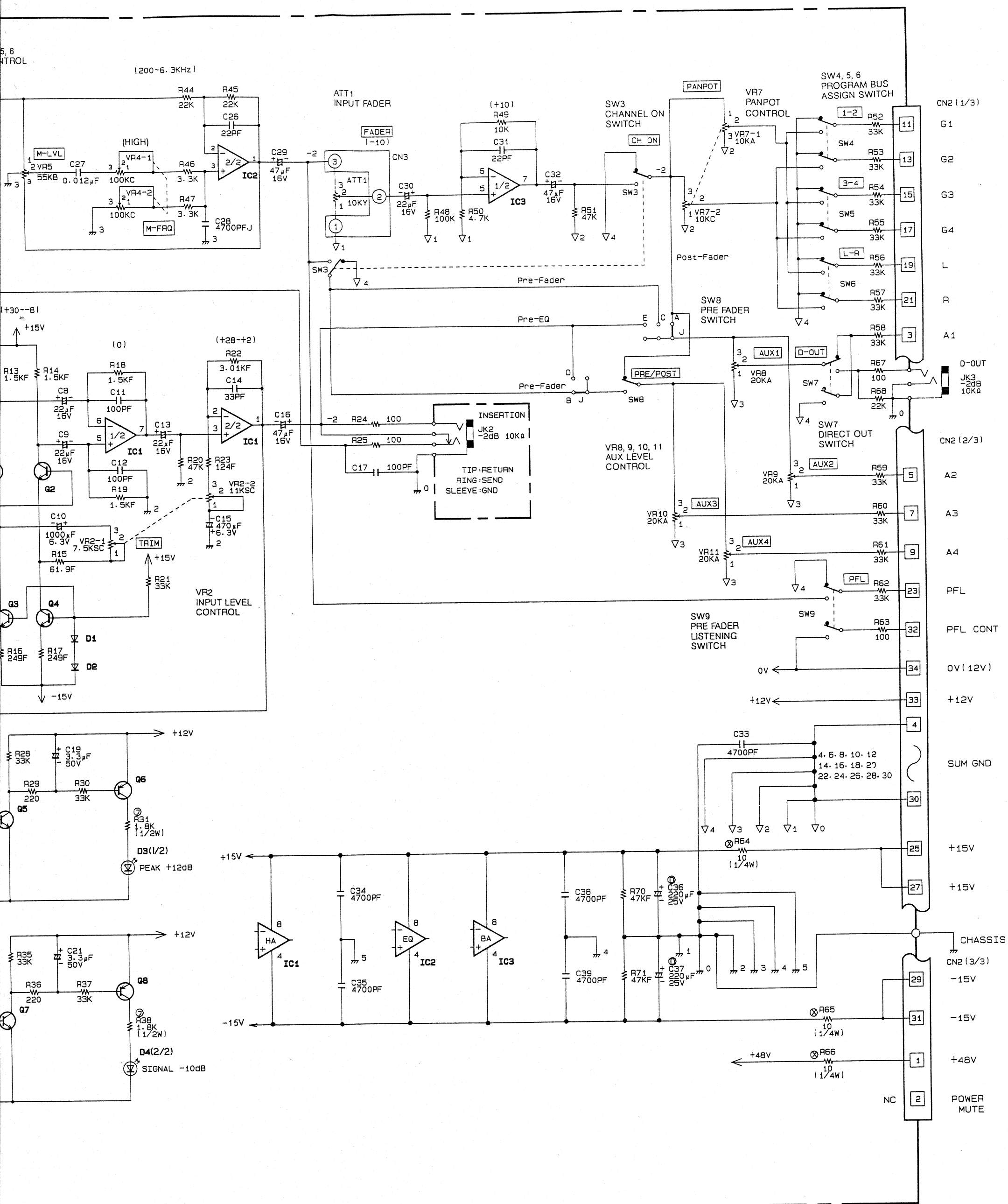
1

SW4-6	Program bus assign SW
SW7	Direct out SW
SW8	Pre fader SW
SW9	Pre fader listening SW

2

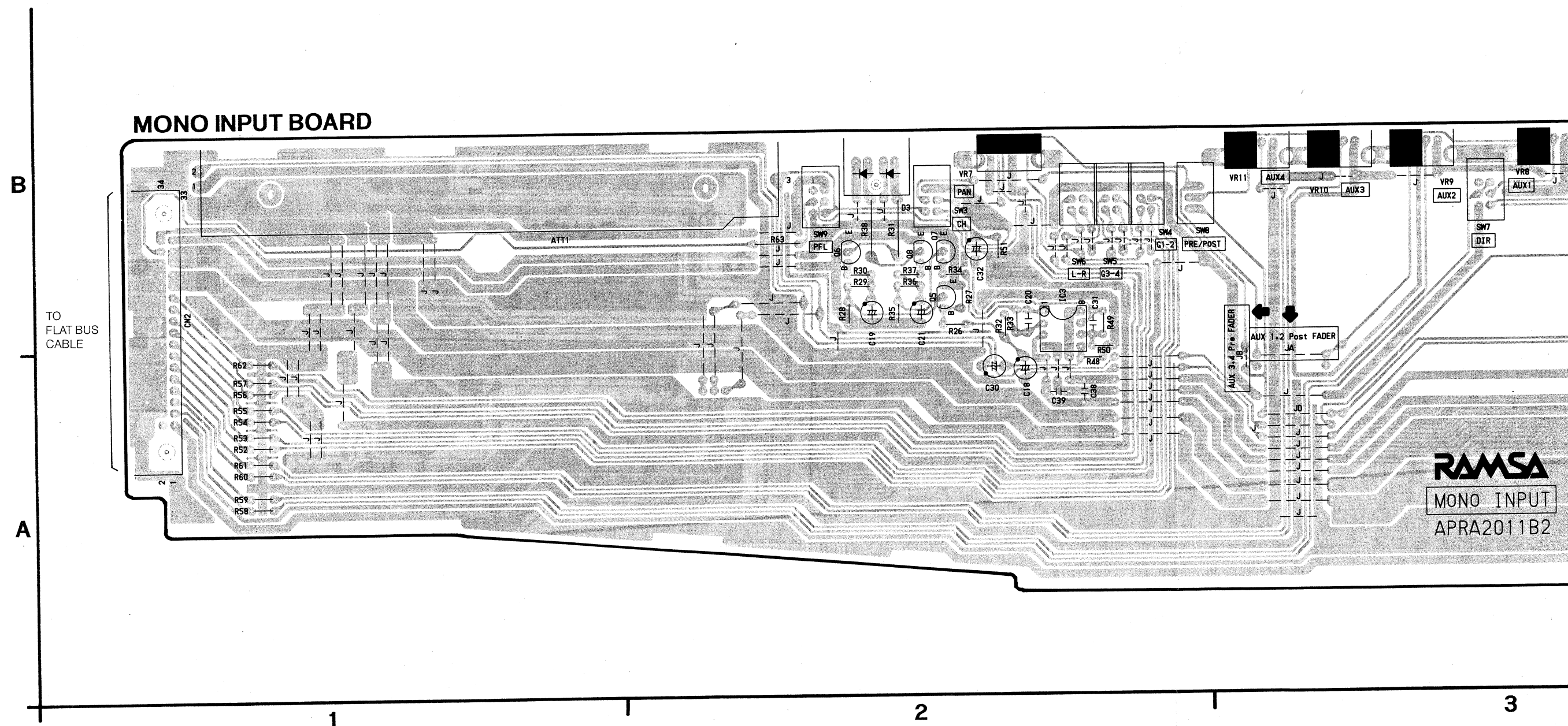
Volume No.	FUNCTION
VR2	Input Level Control
VR3-6	EQ Control
VR7	Panpot Control
VR8-11	AUX Level Control

GRAM OF MONO INPUT



FUNCTION
Level Control
Level Control
Level Control
Level Control

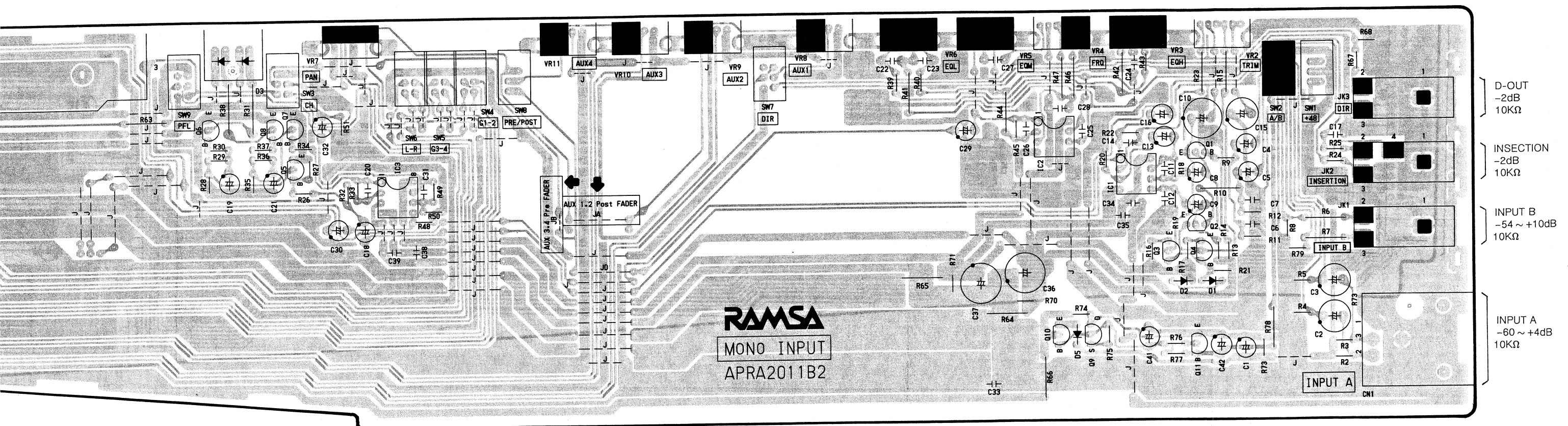
CONDUCTOR VIEW OF MONO INPUT



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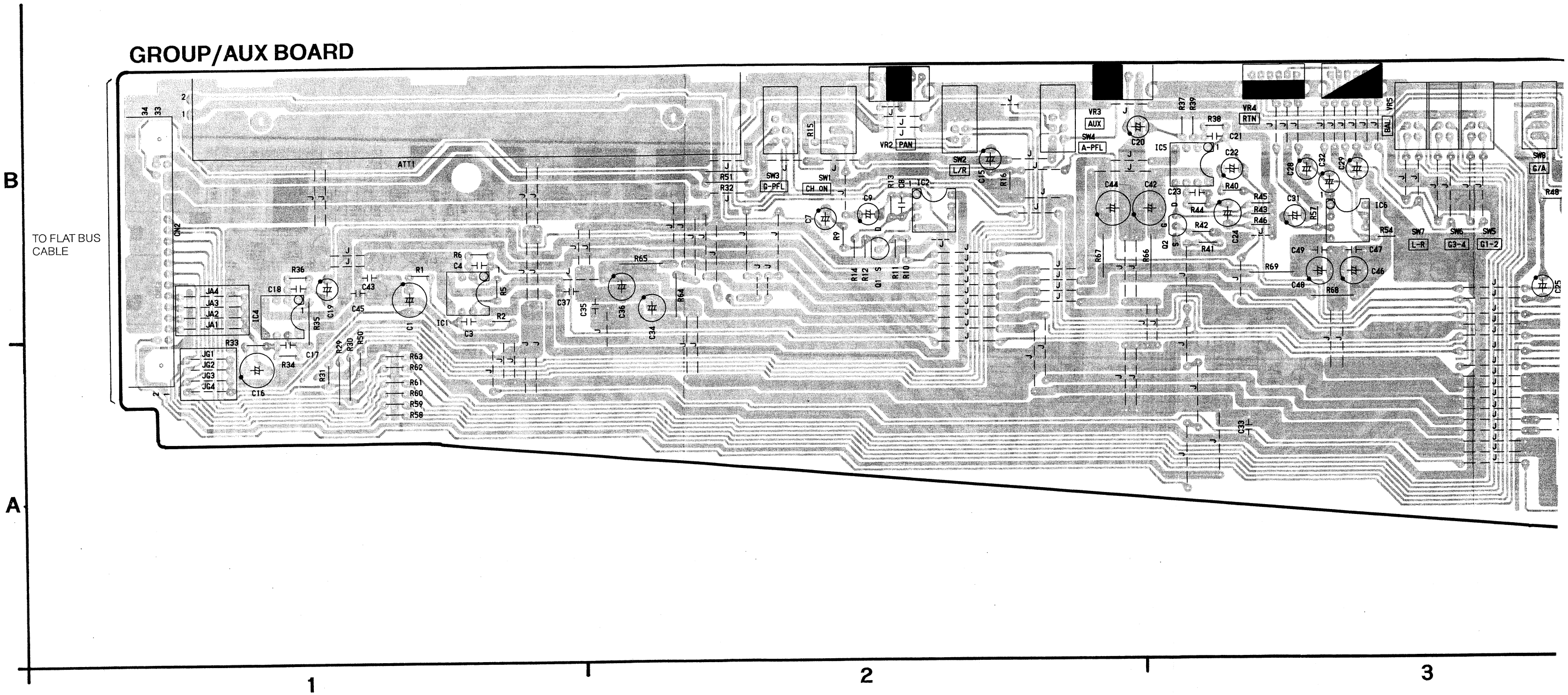
IC1	A4	Q7	B2
IC2	B3	Q8	B2
IC3	B2	Q9	A3
Q1	B4	Q10	A3
Q2	A4	Q11	A4
Q3	A4	D1	A4
Q4	A4	D2	B4
Q5	B2	D3	B2
Q6	B2	D4	B2
		D5	A3

CONDUCTOR VIEW OF MONO INPUT



CONDUCTOR VIEW OF GROUP/AUX

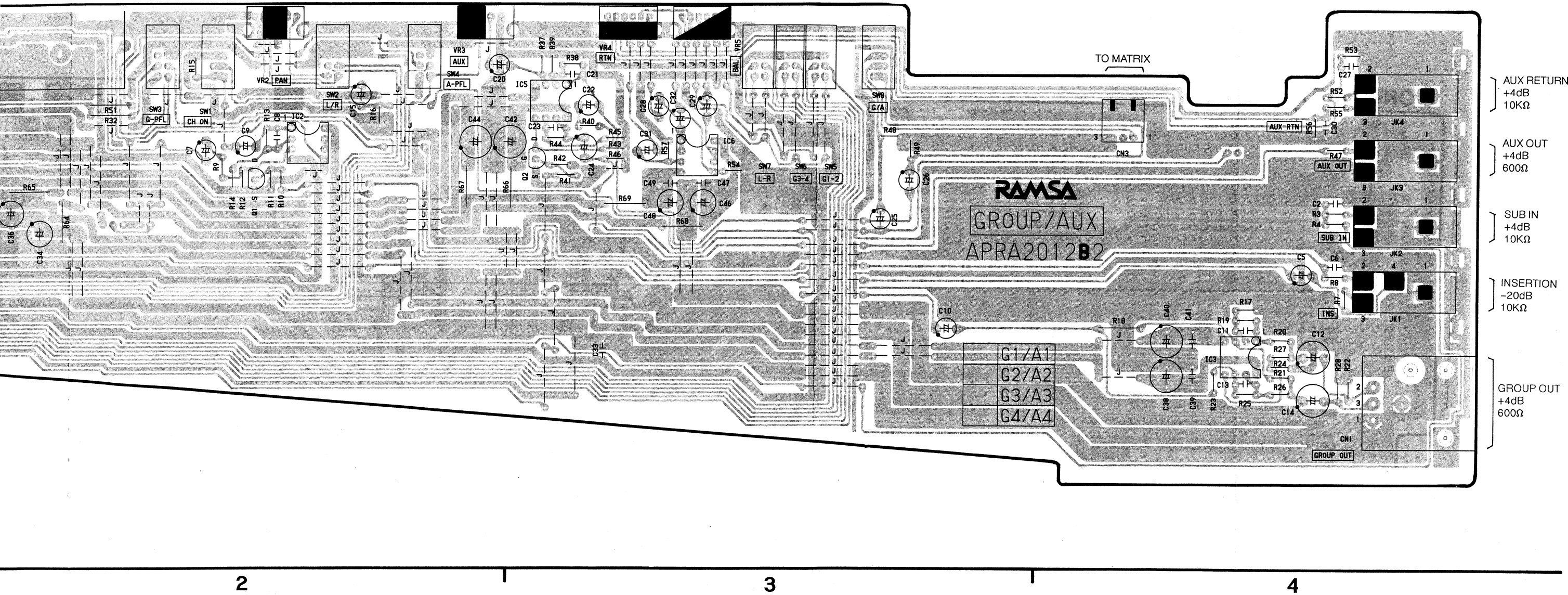
GROUP/AUX BOARD



<Grid Key>

- IC1 A1
- IC2 B2
- IC3 A4
- IC4 A1
- IC5 B2
- IC6 B3
- Q1 B2
- Q2 B2

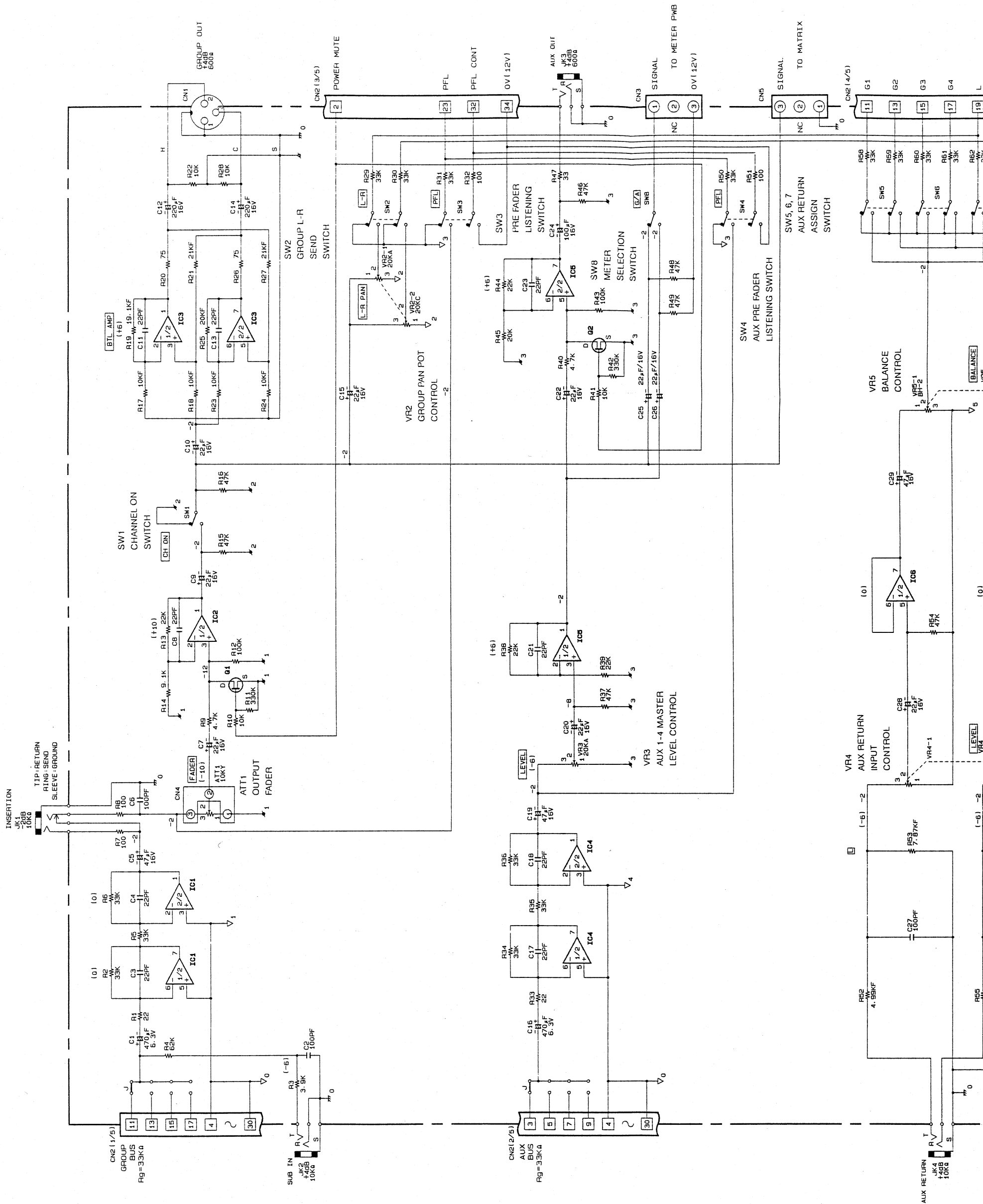
CONDUCTOR VIEW OF GROUP/AUX



C

B

A

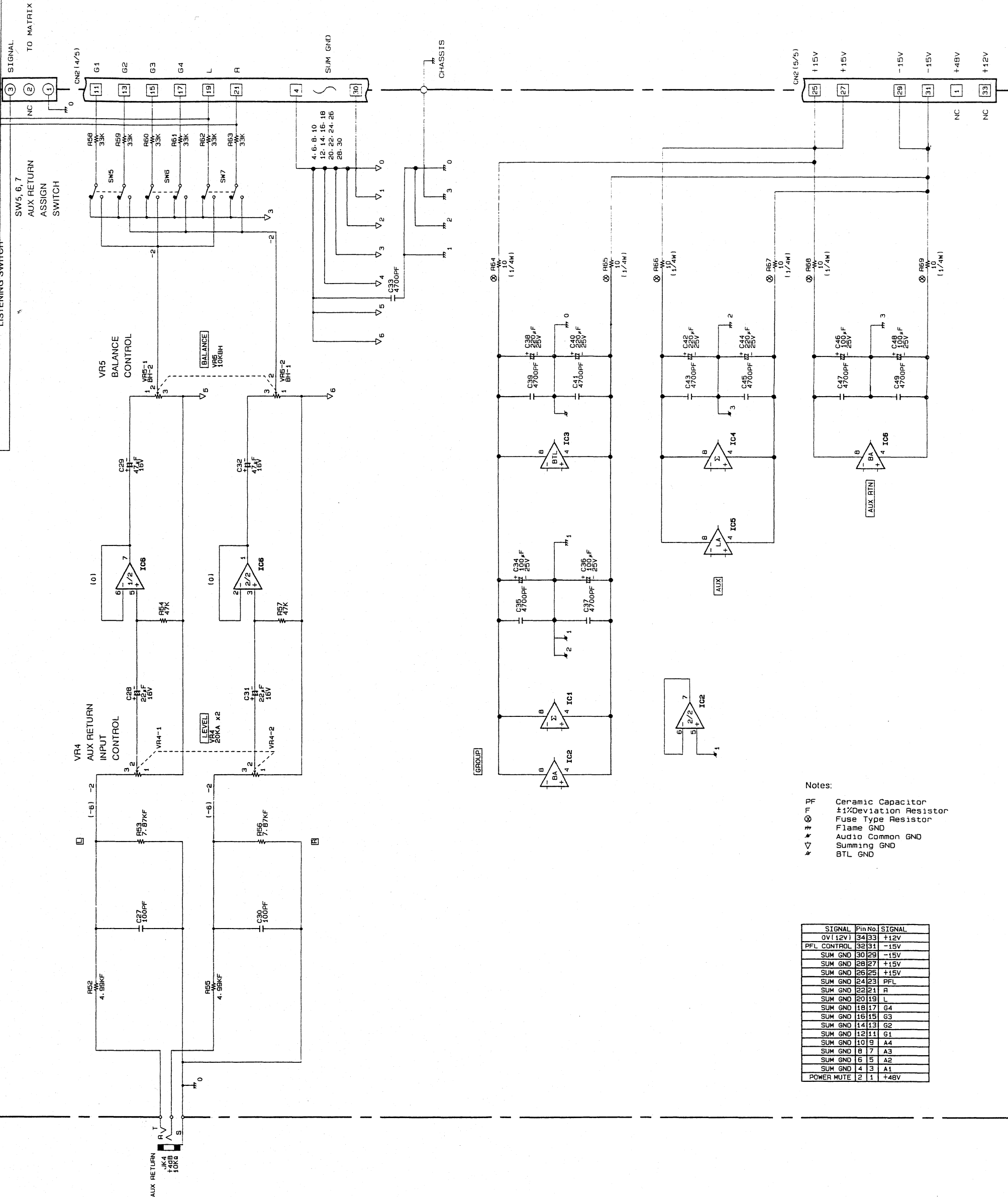


<Grid Key>

- IC1 A1 B3
- IC2 B1 B3
- IC3 C1 B3
- IC4 A2 B4
- IC5 B2 C2 B4
- IC6 B3 B4
- Q1 B1
- Q2 2C

Switch No.	FUNCTION
SW1	Channel ON SW
SW2	Group L/R Send SW
SW3	Pre fader listening SW
SW4	AUX Pre fader listening SW
SW5-7	AUX return assign SW
SW5-7	Meter Selection SW

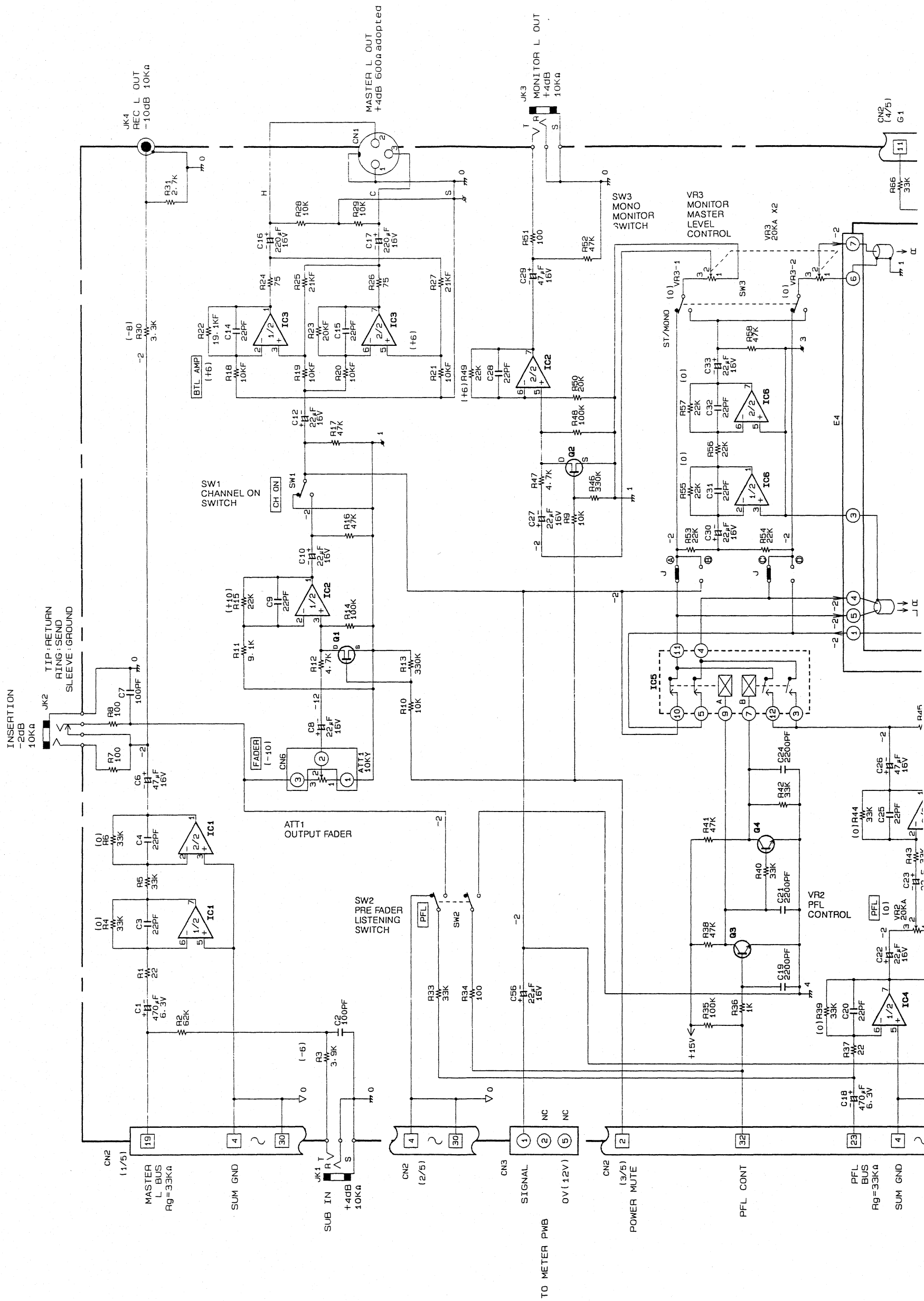
Volume No.	FUNCTION
VR2	Group pan pot control
VR3	AUX 1-4 Master Level Control
VR4	AUX return Input Control
VR5	Balance Control

GRAM OF GROUP/AUX

C

B

A



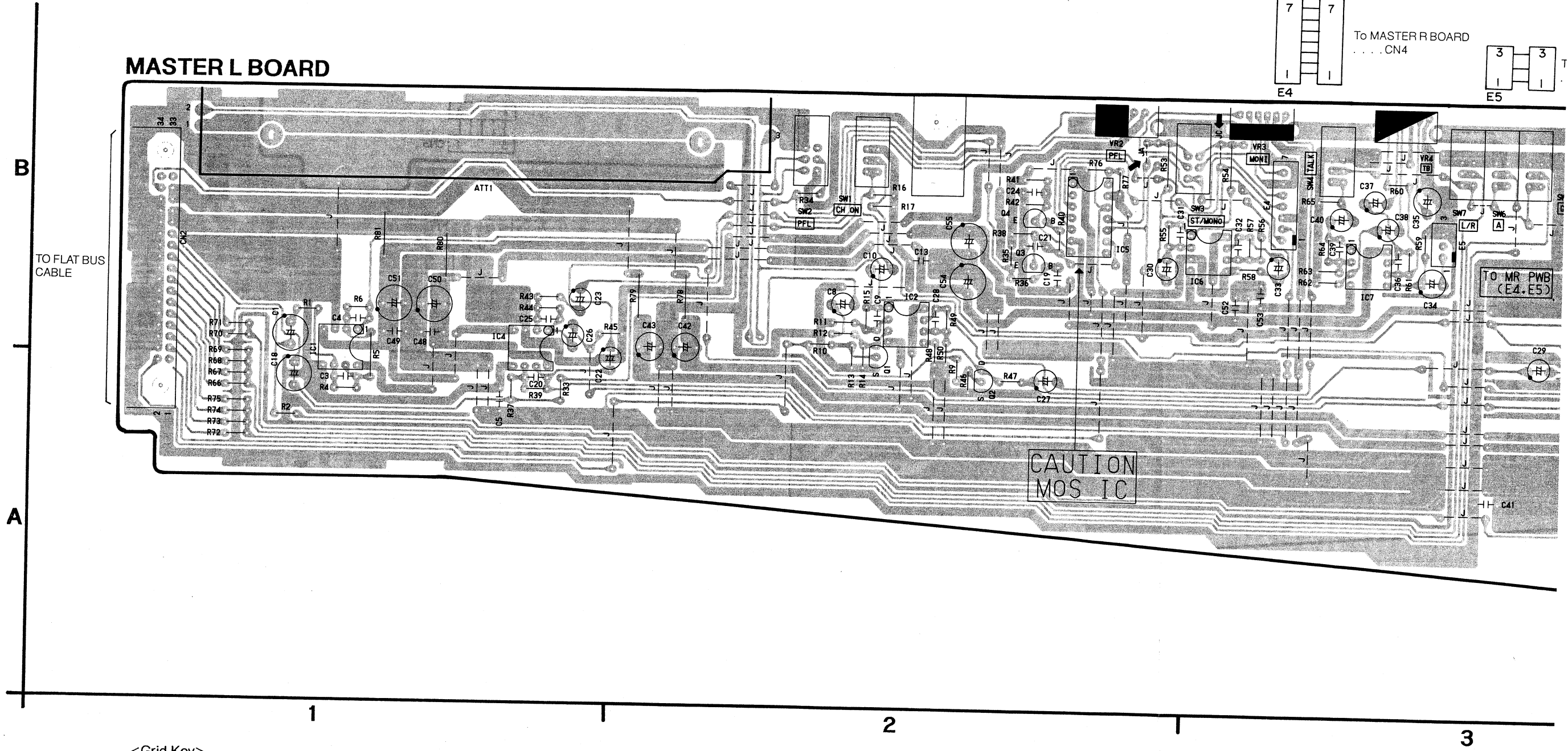
<Grid Key>

- IC1 A1, B1
- IC2 B1, B2, B3
- IC3 C1, B3
- IC4 A2, B4
- IC5 B4
- IC6 B2, B4
- IC7 B3, B4
- Q1 B1
- Q2 B2
- Q3 A2
- Q4 A2

Switch No.	FUNCTION
SW1	Channel ON SW
SW2	Pre fader listening SW
SW3	Mono monitor SW
SW4	Talk back ON/OFF SW
SW5-7	Talk back assign SW

Volume No.	FUNCTION
VR2	Channel ON SW
VR3	Pre fader listening SW
VR4	Mono monitor SW

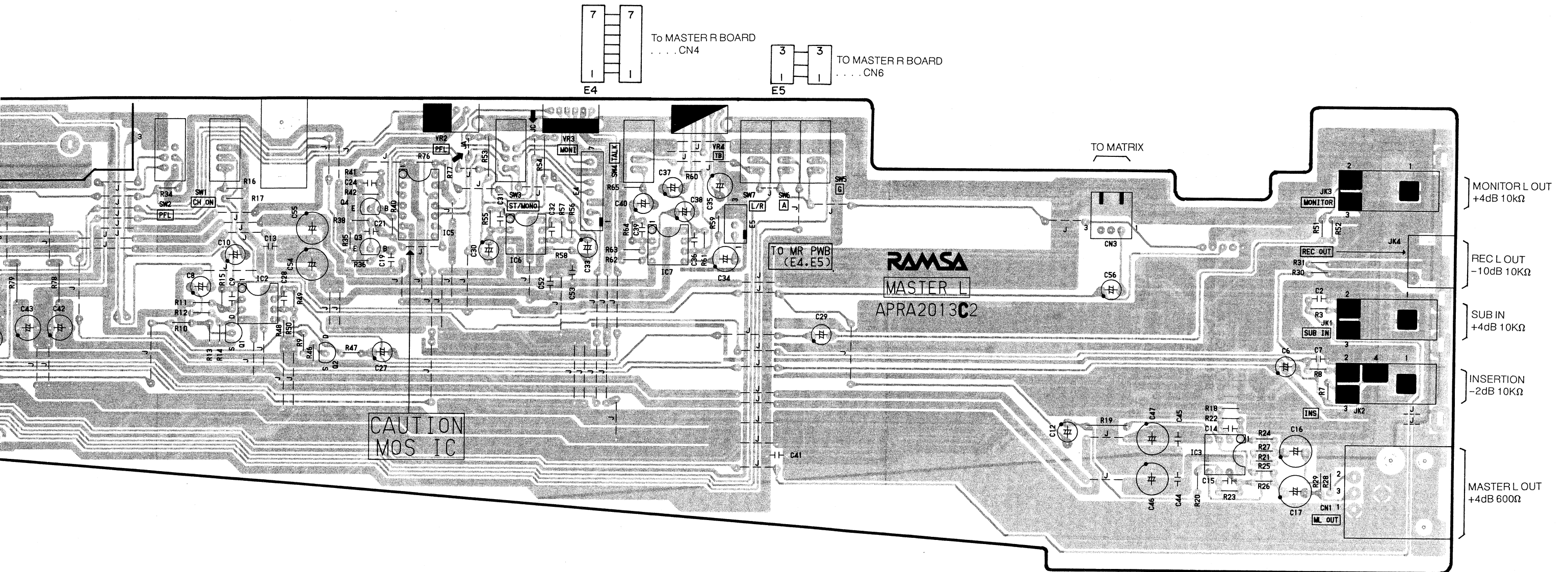
CONDUCTOR VIEW OF MASTER L



<Grid Key>

- IC1 A1
- IC2 B2
- IC3 A4
- IC4 A1
- IC5 B2
- IC6 B2
- IC7 B3
- Q1 A2
- Q2 A2
- Q3 B2
- Q4 B2

CONDUCTOR VIEW OF MASTER L



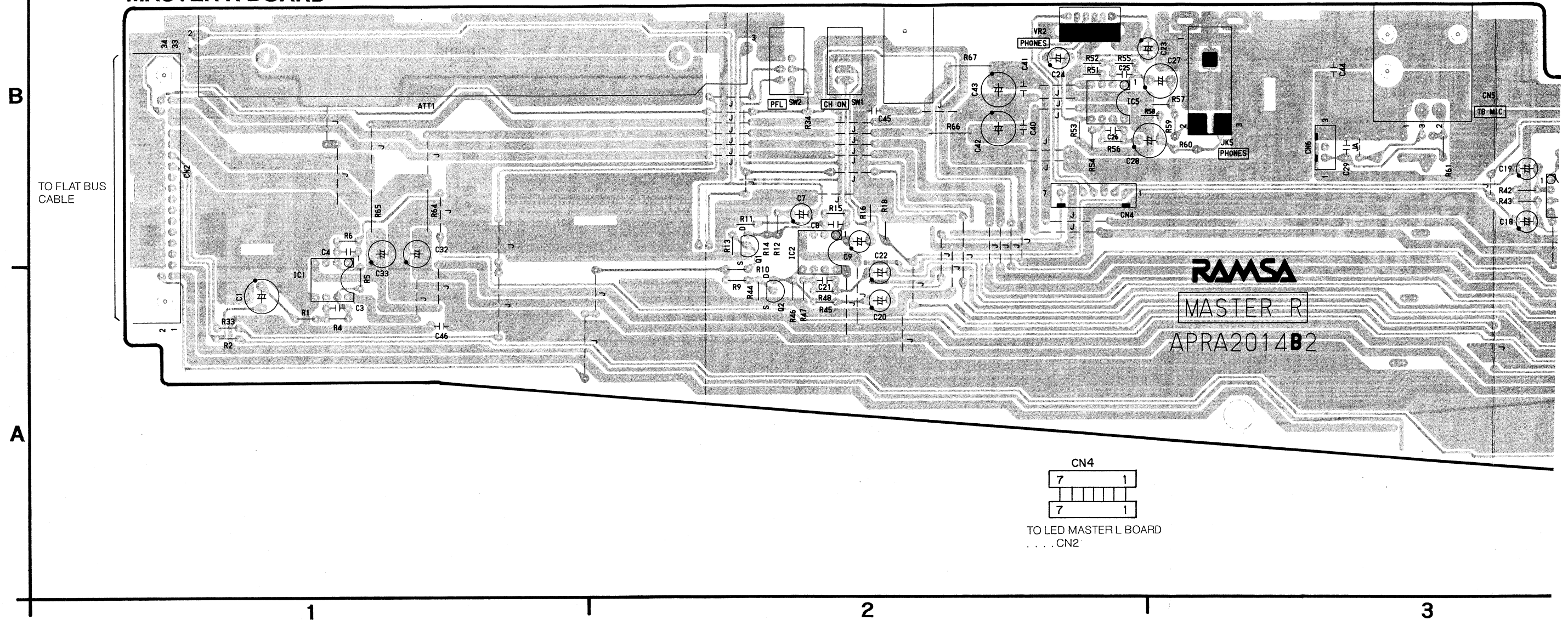
2

3

4

CONDUCTOR VIEW OF MASTER R

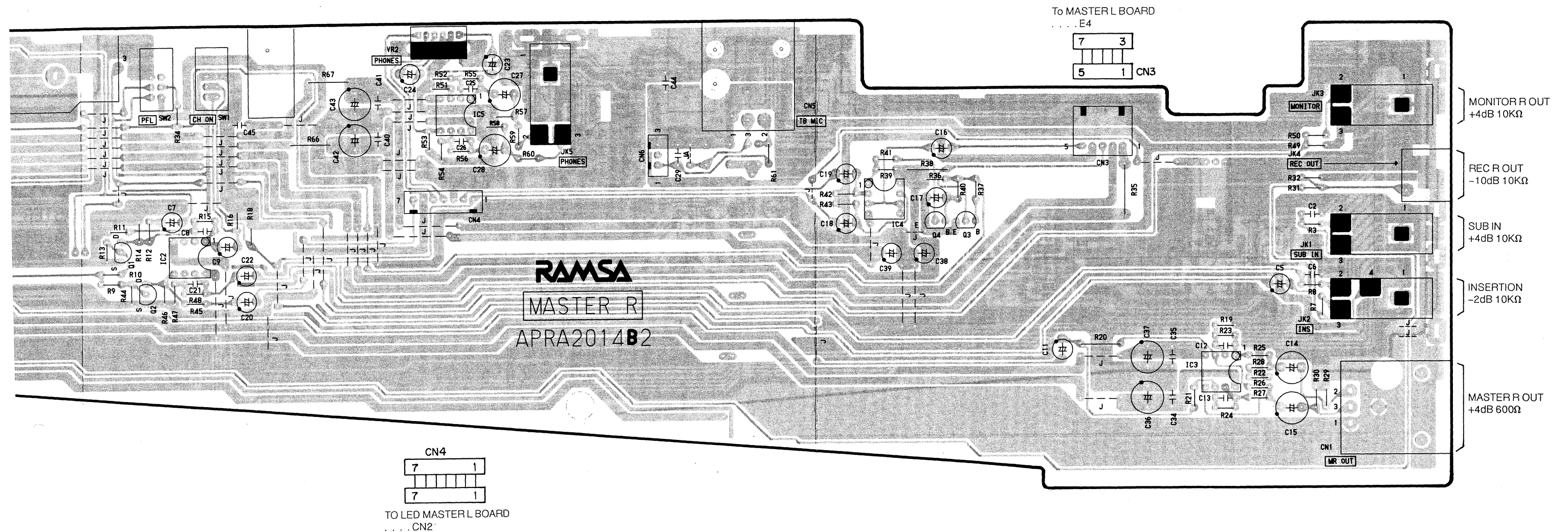
MASTER R BOARD



<Grid Key>

- IC1 A1
- IC2 A2
- IC3 A4
- IC4 B3
- IC5 B2
- Q1 A2
- Q2 A2
- Q3 B3
- Q4 B3

CONDUCTOR VIEW OF MASTER R



2

3

4

<Grid Key>

- IC1 A1, B1
- IC2 B1, C1
- IC3 C1
- IC4 B2
- IC5 C2
- Q1 B1
- Q2 C2
- Q3 A2
- Q4 A2

Switch No.	FUNCTION
SW1	Channel ON SW
SW2	Pre fader listening SW

Volume No.	FUNCTION
VR2	Headphone level Control

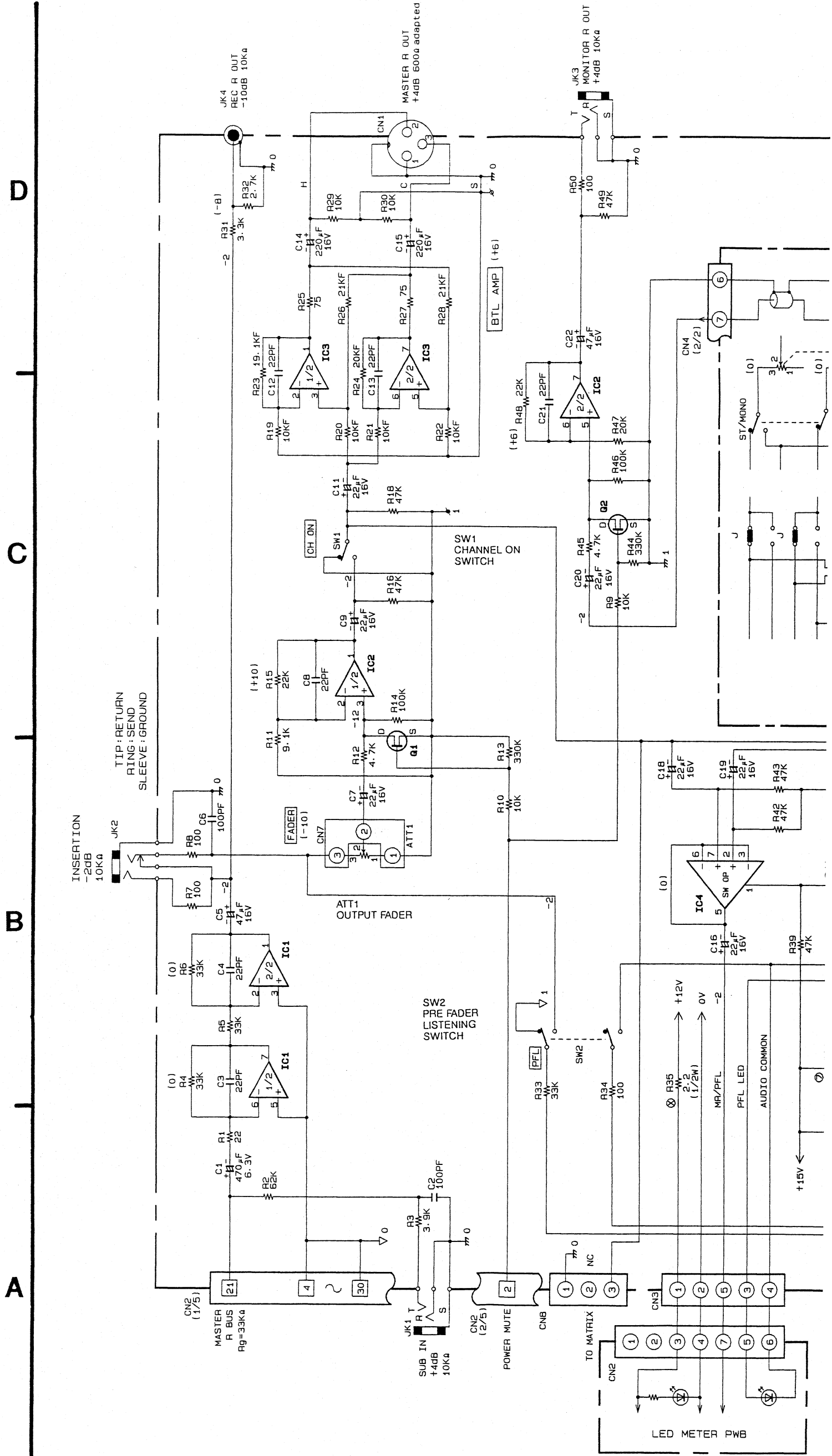
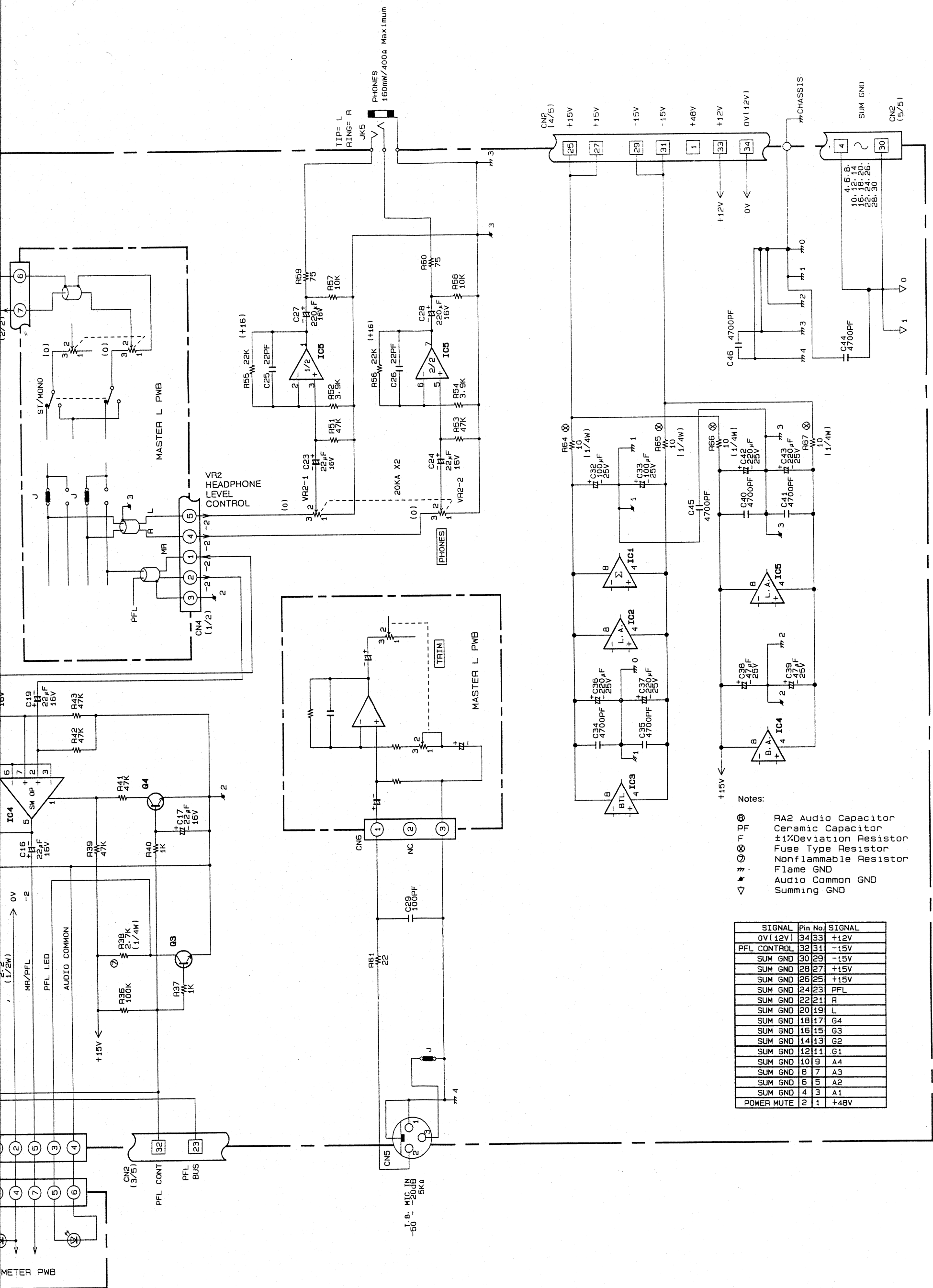


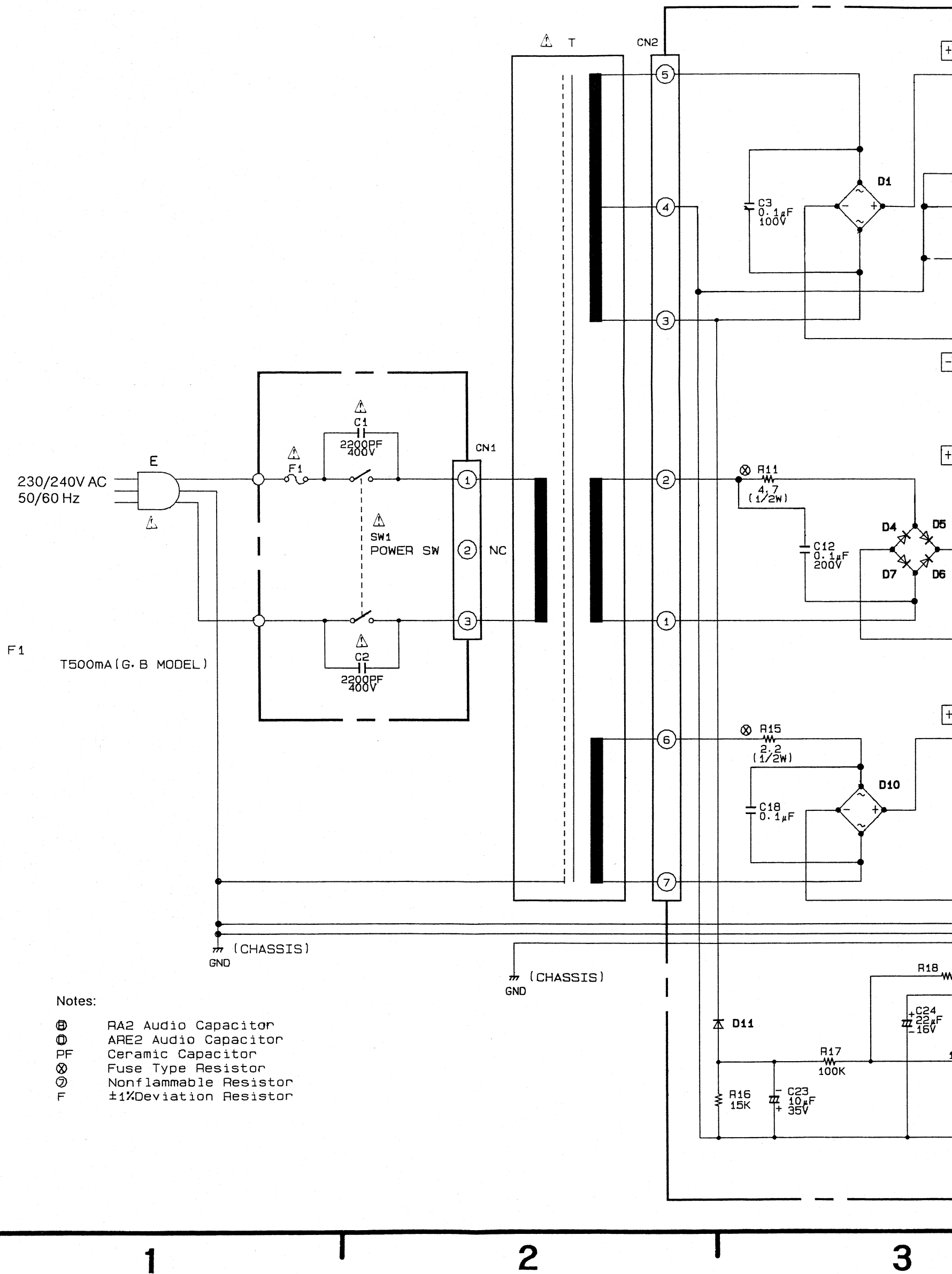
DIAGRAM OF MASTER R



C

B

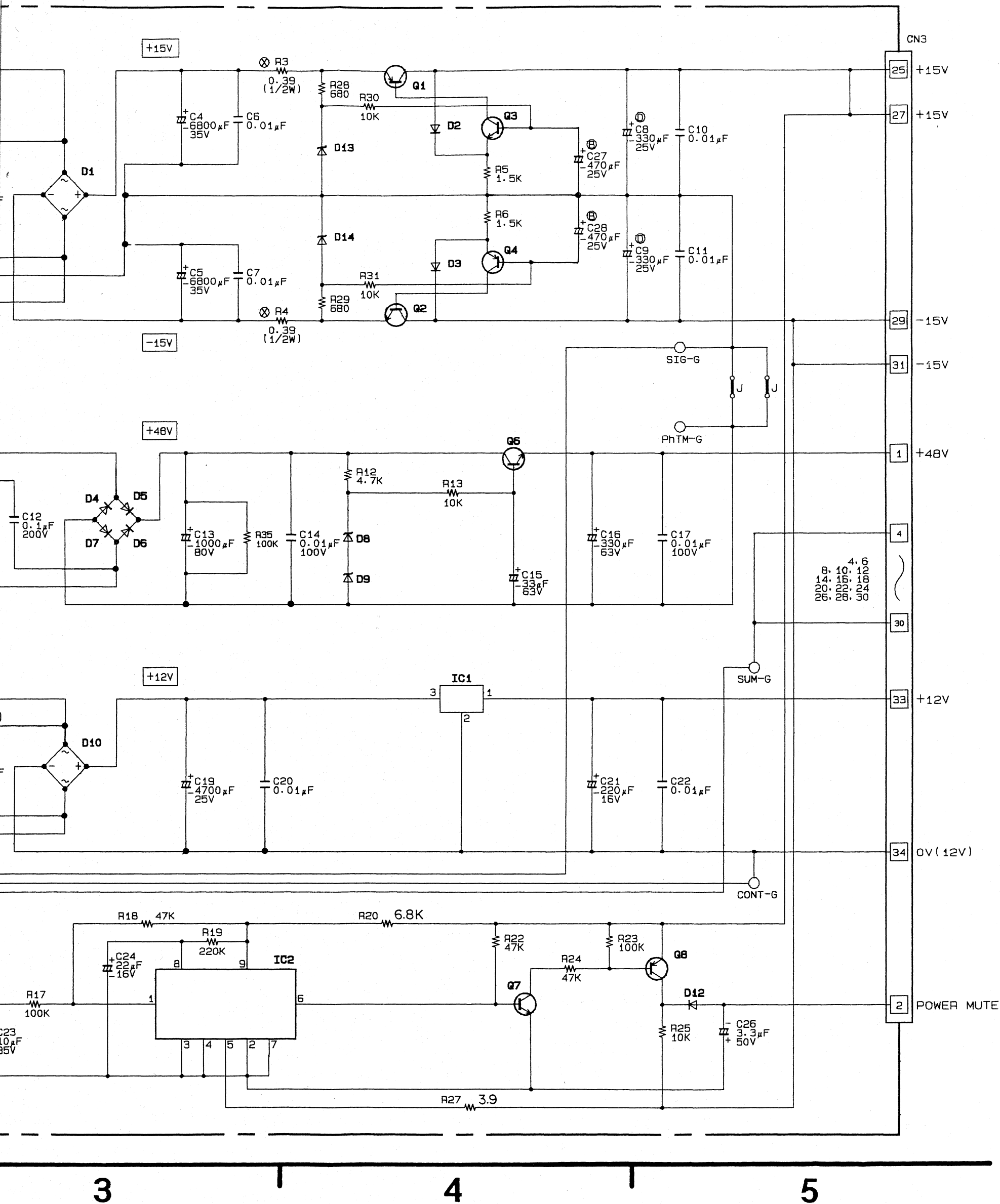
A



<Grid Key>

IC1	B4	D1	C3
IC2	A3	D2, 3	4C
Q1	C4	D4, 5, 6, 7	B3
Q2	C4	D8, 9	B4
Q3	C4	D10	B3
Q4	C4	D11	A2
Q6	B4	D12	A5
Q7	A4	D13, 14	C4
Q8	A4		

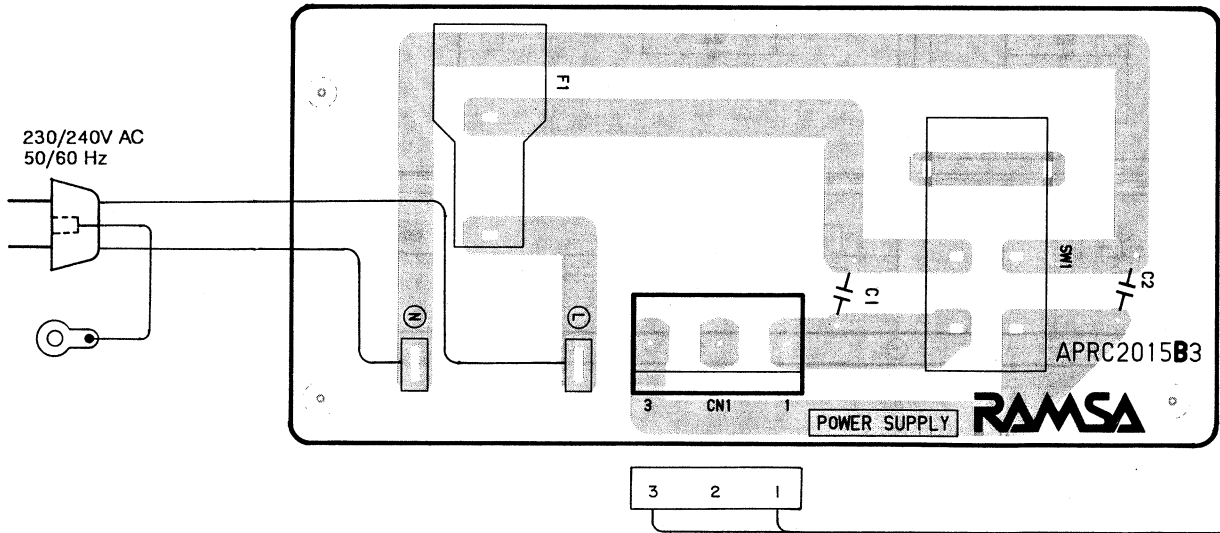
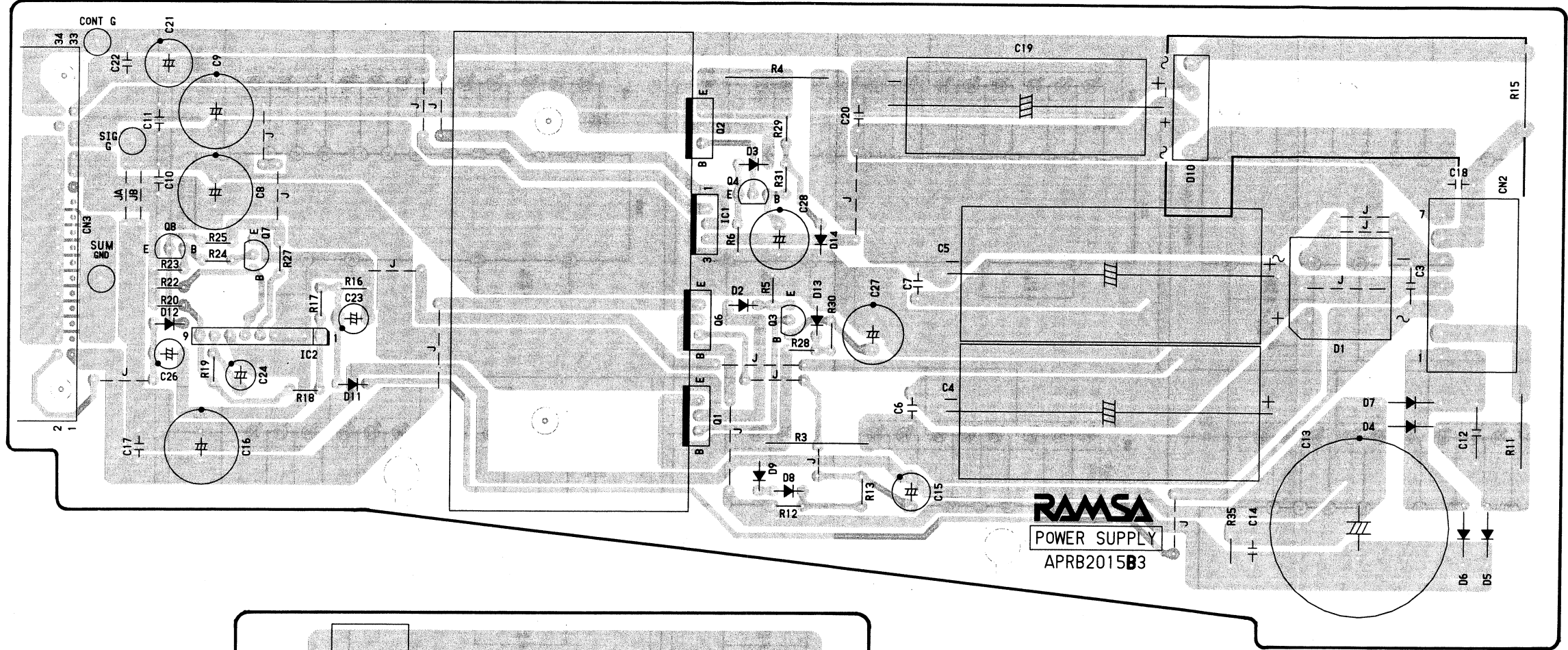
DIAGRAM OF POWER SUPPLY



CONDUCTOR VIEW OF POWER SUPPLY

POWER SUPPLY BOARD

TO FLAT BUS
CABLE



SW1 : POWER SWITCH

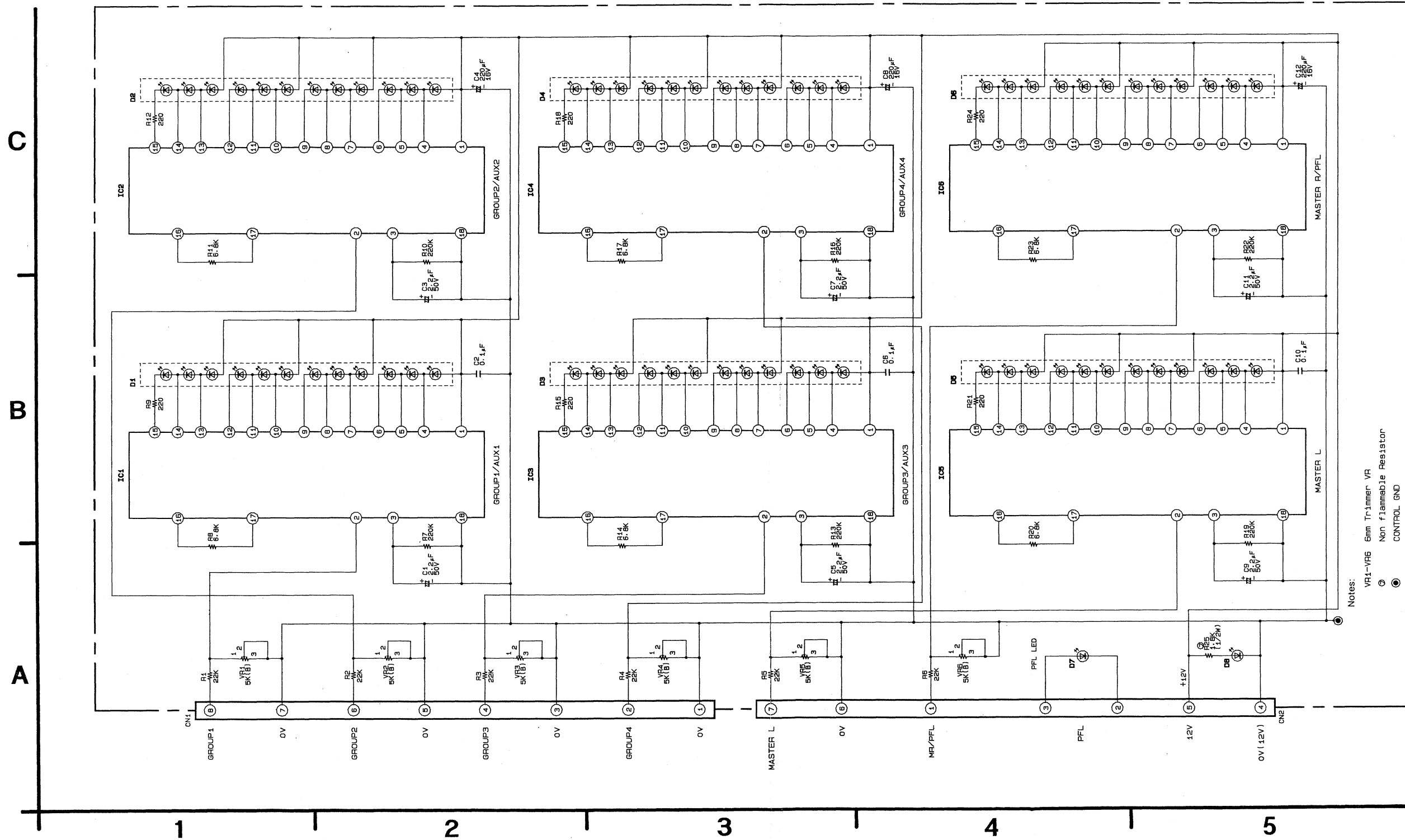
T1
POWER
TRANSFORMER

GREEN

<Grid k

- IC1 B2
- IC2 B1
- Q1 B2
- Q2 B2
- Q3 B2
- Q4 B2
- Q6 b2
- Q7 B2
- Q8 B1
- D1 B3
- D2 B2
- D3 B2
- D4 B3
- D5 A3
- D6 A3
- D7 B3
- D8 A2
- D9 A2
- D10 B3
- D11 B1
- D12 B1
- D13 B2
- D14 B2

SCHEMATIC DIAGRAM OF LED METER



<Grid Key>

IC1 B1

IC2 C1

IC3 B2

IC4 C2

IC5 B4

IC6 C4

D1 B1

D2 C1

D3 B2

D4 C2

D5 B4

D6 C4

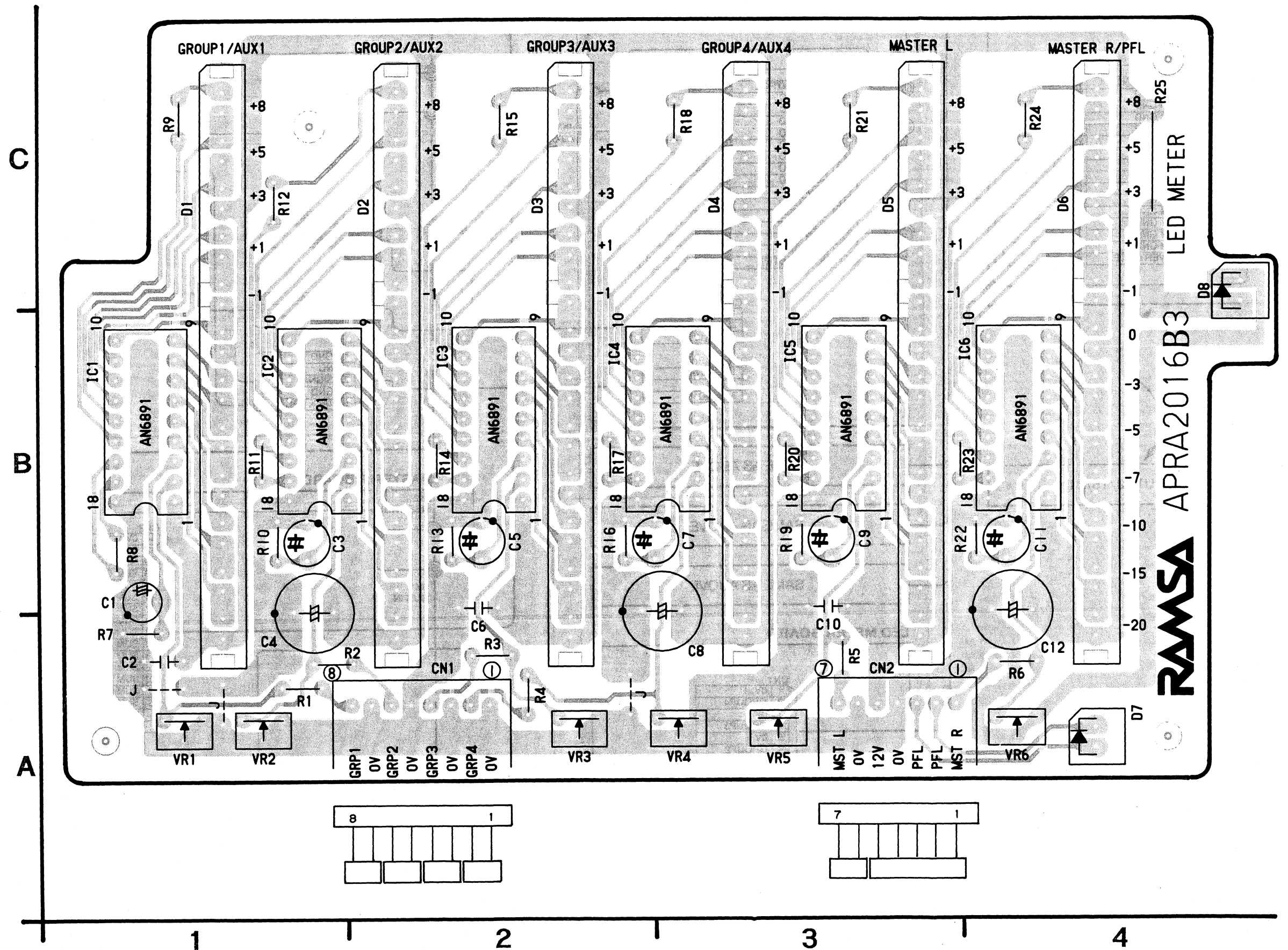
Notes:

VR1-VR6 6mm Trimmer VR
 Ⓒ Non flammable Resistor
 Ⓢ CONTROL GND

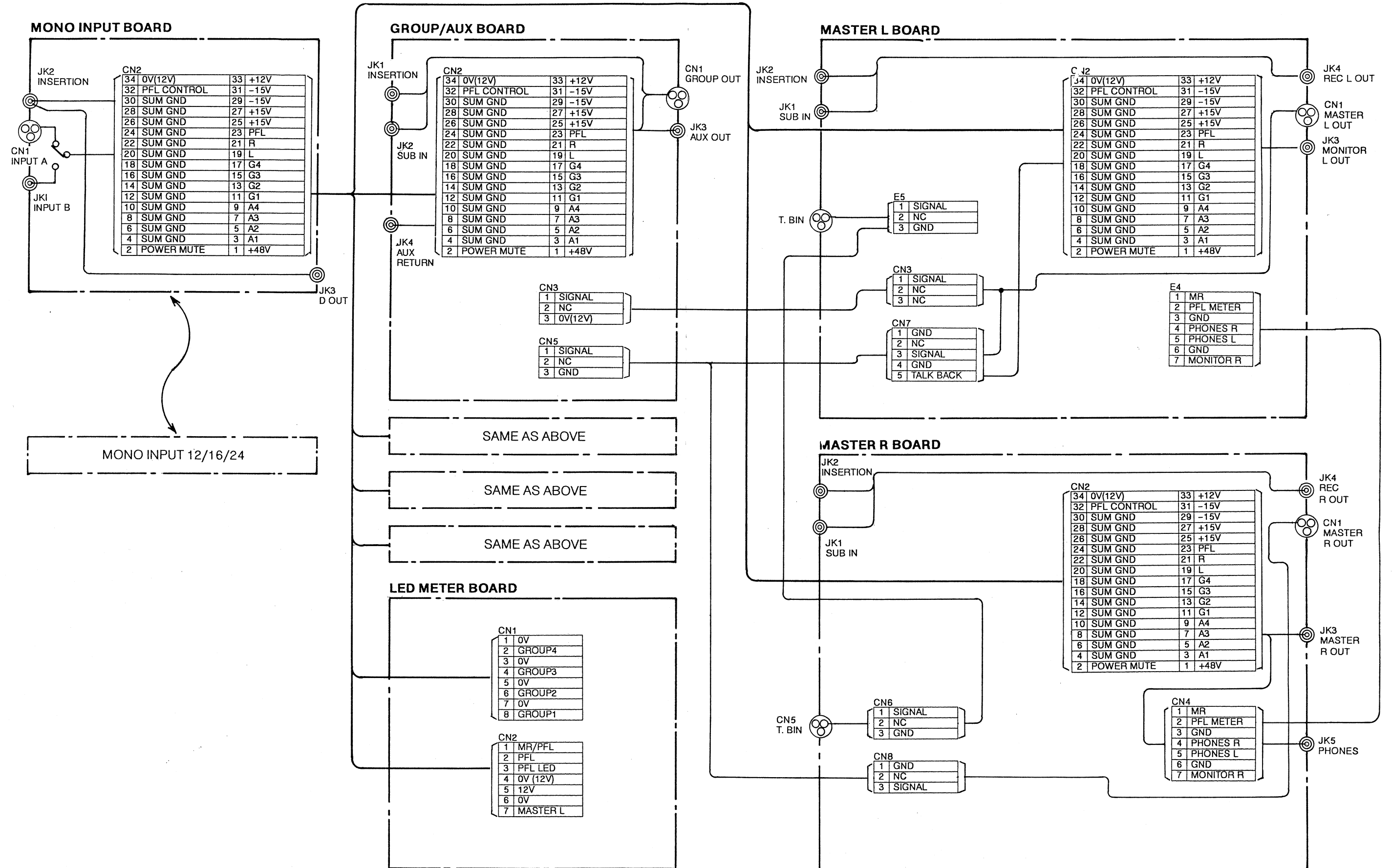
CONDUCTOR VIEW OF LED METER

<Grid Key>

IC1 B1
IC2 B1
IC3 B2
IC4 B2
IC5 B3
IC6 B4
D1 C1
D2 C2
D3 C2
D4 C3
D5 C3
D6 C4



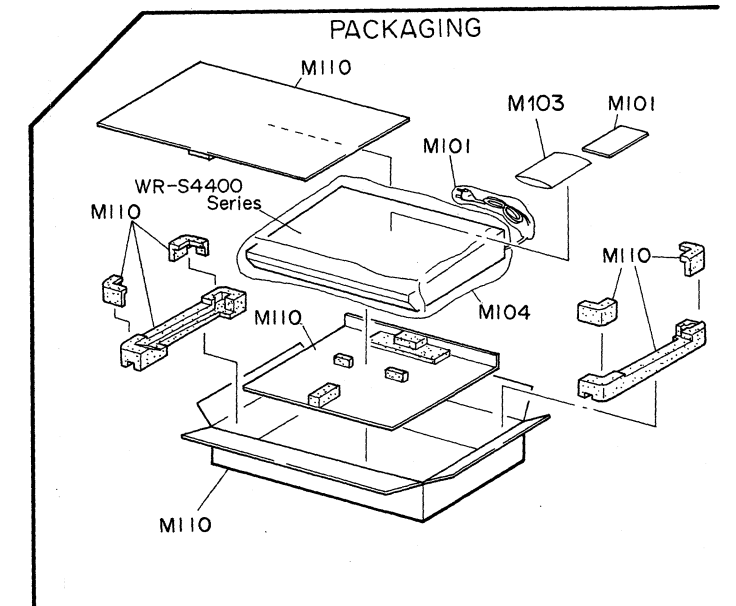
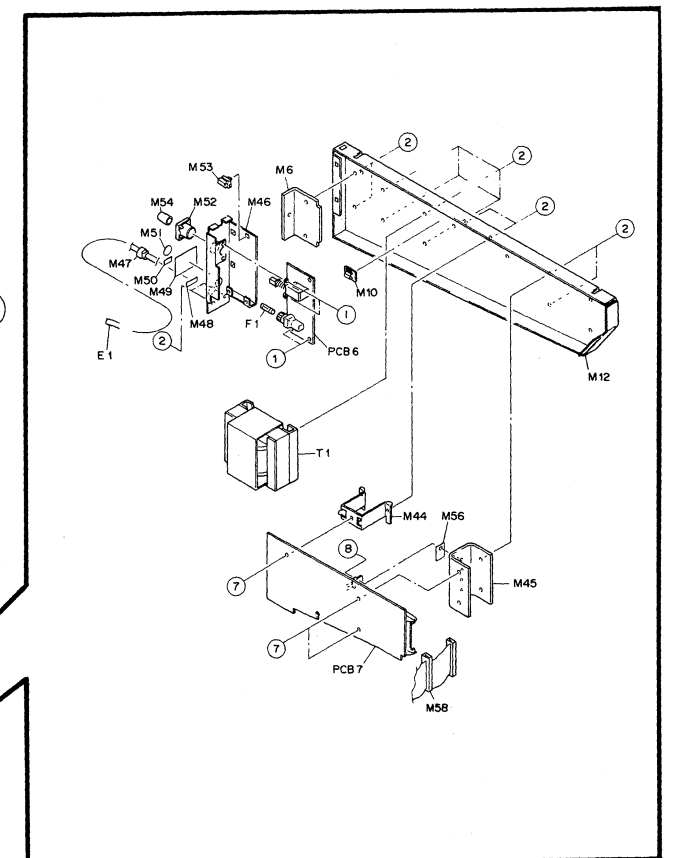
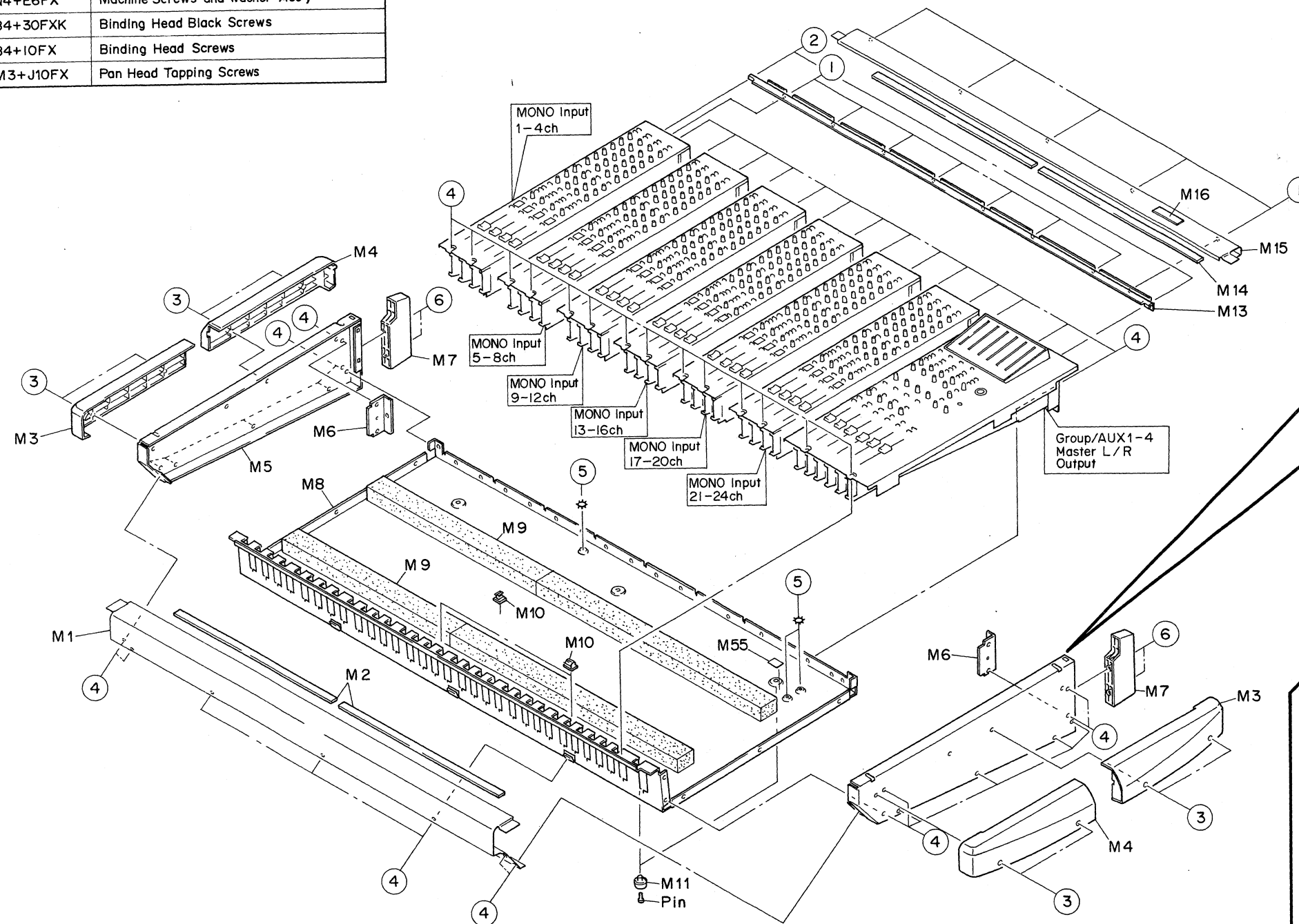
TOTAL CONNECTION DIAGRAM



EXPLODED VIEW OF CONSOLE

○ Numbers show screws, washers, nuts, etc.

NO	Screws	Description
①	XTB3+6FFXK	Binding Head Tapping Black Screws
②	XTB3+8FXK	Binding Head Black Screws
③	XSB4+20FXK	Binding Head Black Screws
④	XSB4+8FXK	Binding Head Black Screws
⑤	XYN4+E6FX	Machine Screws and Washer Ass'y
⑥	XSB4+30FXK	Binding Head Black Screws
⑦	XSB4+10FX	Binding Head Screws
⑧	XYM3+J10FX	Pan Head Tapping Screws

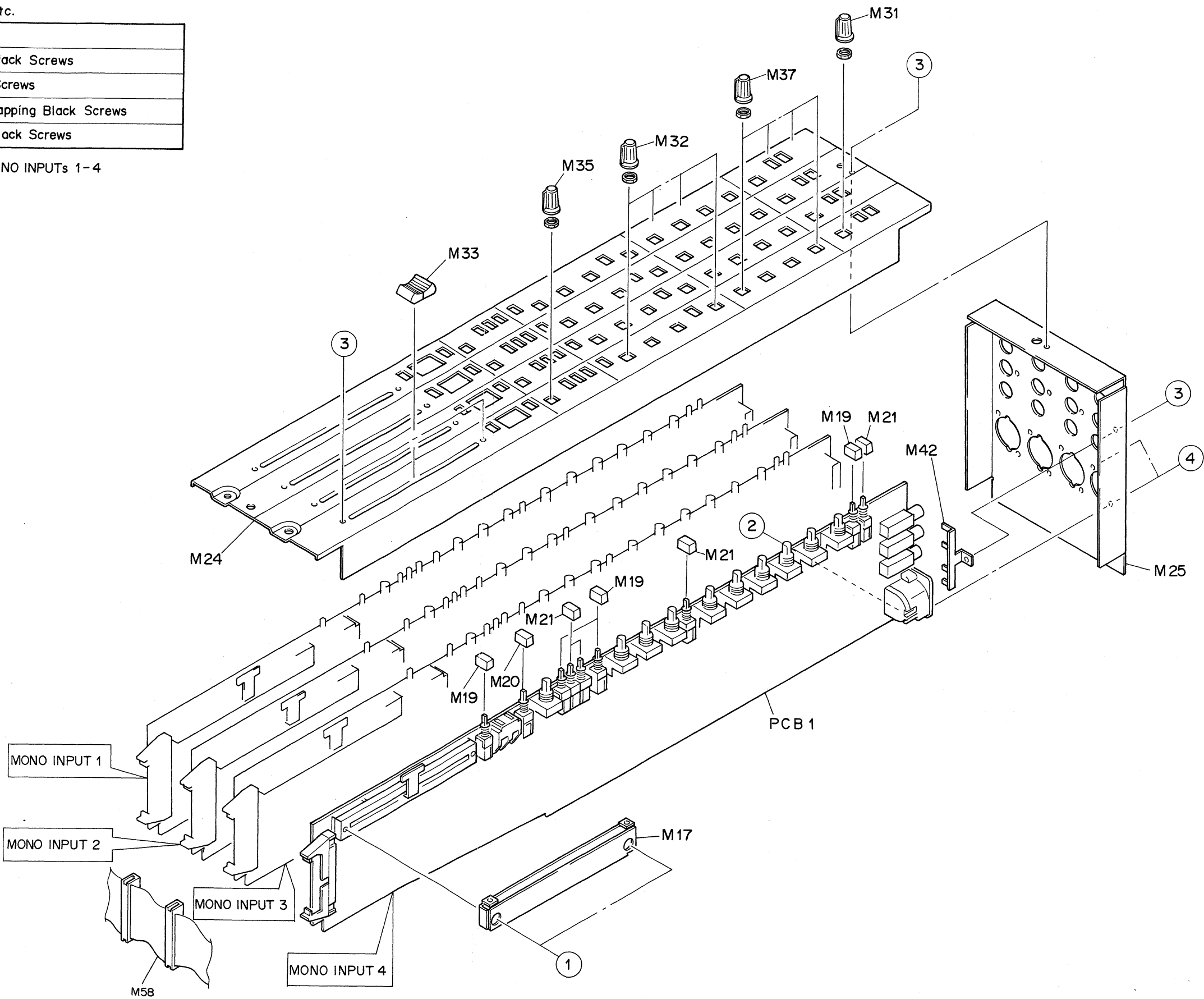


EXPLODED VIEW OF MONO INPUT

○ Number show screws, washers,nuts,etc.

NO	Screws	Description
①	XSB3+4FXK	Binding Head Black Screws
②	XTB3+6JFX	Binding Head Screws
③	XTB3+6FFXK	Binding Head Tapping Black Screws
④	XTB3+6JFXK	Binding Head Black Screws

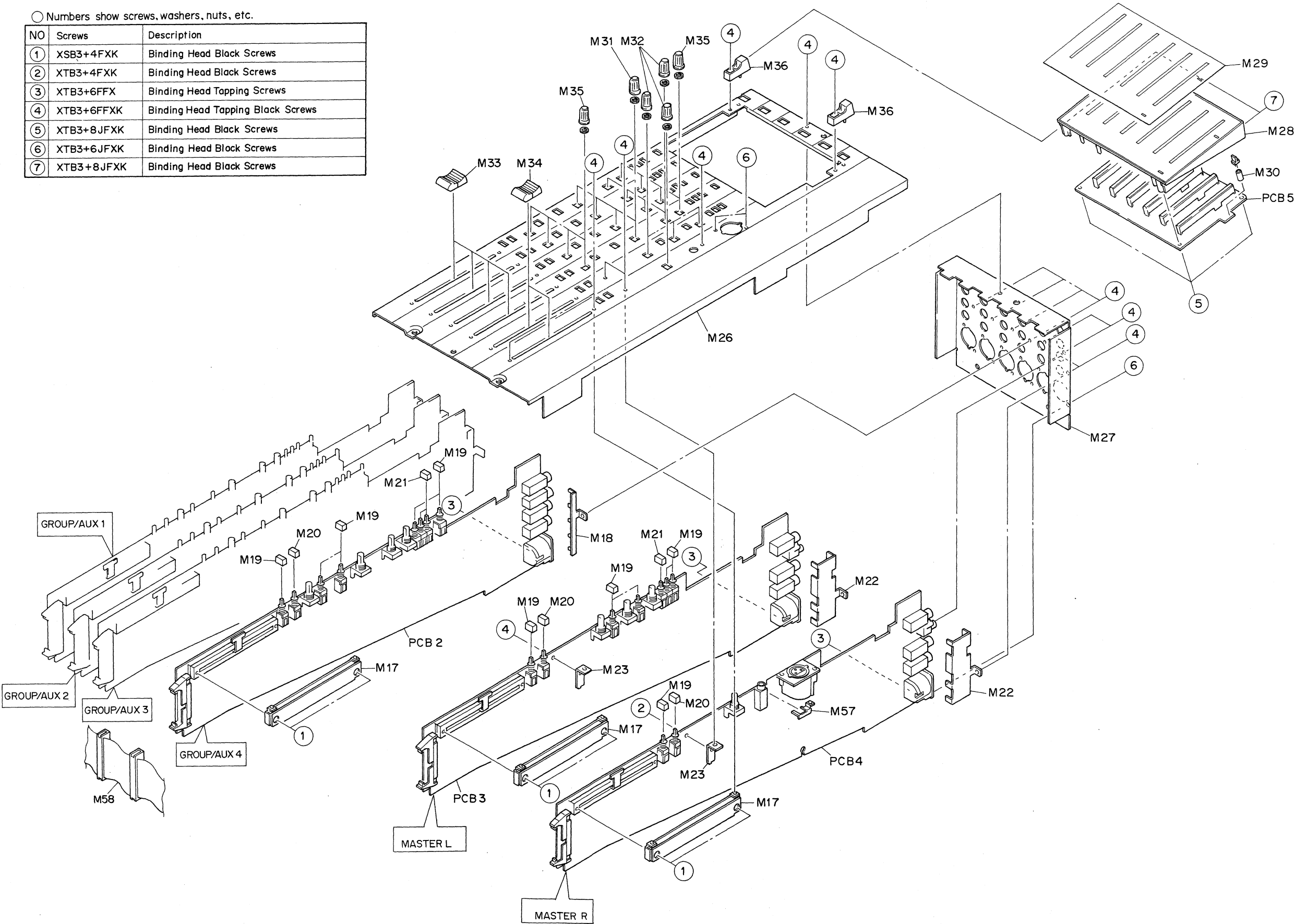
* MONO INPUTs 5-24 as same as MONO INPUTs 1-4



EXPLODED VIEW OF GROUP/AUX

○ Numbers show screws, washers, nuts, etc.

NO	Screws	Description
①	XSB3+4FXK	Binding Head Black Screws
②	XTB3+4FXK	Binding Head Black Screws
③	XTB3+6FFX	Binding Head Tapping Screws
④	XTB3+6FFXK	Binding Head Tapping Black Screws
⑤	XTB3+8JFXK	Binding Head Black Screws
⑥	XTB3+6JFXK	Binding Head Black Screws
⑦	XTB3+8JFXK	Binding Head Black Screws



REPLACEMENT PARTS LIST

Important Notice

1. Components identified by "△" mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.
2. Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
MISCELLANEOUS					
T101 F101 E101	△ △ △ YWAPTA00100A4 XBA2C05ET0A YFVM030908A YWAACA0010A4	Power Transformer Current Fuse 500mA 250V AC Power Cord for WR-S4424/G, WR-S4416 /G and WR-S4412 /G AC Power Cord for WR-S4424/B, WR-S4416 /B and WR-S4412 /B	M26 M27 M28 M29 M31	YWA5WA1276A2 YWA5WA1277A3 YWA5KA1169A1 YWA1RA0024A4 YWA5RA0336A3	Upper Panel Rear Panel LED Case LED Front Panel VR Knob (Red)
M1	YWA5DA0319A2 YWA5DA0313A2 YWA5DA0317A2 YWA2NA0370A4 YWA5DA0315A3	Ornament for WR-S4424 Ornament for WR-S4416 Ornament for WR-S4412 Spacer Ornament	M32 M33	YWA5RA0362A3 YWA5RB0340A3 YWA5RA0340A3	VR Knob (White) Fader Knob (Red) for GROUP / AUX Fader Knob (White) for MONO INPUT Unit
M2 M3	YWA5DA0316A3 YWA5KA1168A3 YWA3BA0083A4 YWA2XA0093A3 YWA2KA0708A1	Ornament Case Supporting Angle Protector Chassis for WR-S4424	M34 M35 M36 M37	YWA5RC0340A3 YWA5RE0336A3 YWA2EA0171A4 YWA5RC0336A3	Fader Knob (Blue) for GROUP / AUX Unit VR Knob (Black) Mounting Guide for LED VR Knob (Blue)
M4 M5 M6 M7 M8	YWA5DA0316A3 YWA5KA1168A3 YWA3BA0083A4 YWA2XA0093A3 YWA2KA0708A1	Ornament Case Supporting Angle Protector Chassis for WR-S4424	M42 M46 M47 M48	YWA3BA0084A4 YWA5WA1273A2 YWSR6W1 YWA7MA0149A4	Supporting Angle for MONO INPUT Unit Panel Cord Clamp Safety Label
M9	YWA2KA0705A1 YWA2KA0707A1 YWA2FC0541A4 YWA2FB0541A4 YWA2FA0541A4	Chassis for WR-S4416 Chassis for WR-S4412 Cushion for WR-S4424 Cushion for WR-S4416 Cushion for WR-S4412	M49	YWA7QA2723A4 YWA7QB2723A4 YWA7QC2723A4 YWA7QA2723A4 YWA7QB2723A4	Main Label for WR-S4424/G Main Label for WR-S4416/G Main Label for WR-S4412/G Main Label for WR-S4424/B Main Label for WR-S4416/B
M10 M11 M12 M13	YWDKN-5 YW1492 YWA5KA1167A3 YWA3BA0093A2	Cord Clamp Rubber Foot Case Supporting Angle for WR-S4424/B,G	M50 M51 M52 M53	YWA7QC2723A4 YWA6UB10 YWA7SA0447A4 YWA5DA0020A3 YW2196	Main Label for WR-S4412/B Label Label Ornament Card Holder
M14	YWA3BA0082A2 YWA3BA0092A2 YWA2NA0371A4	Supporting Angle for WR-S4416/B,G Supporting Angle for WR-S4412/B,G Spacer	M54 M55 M58	YWBM90HR02B YWA7SA0689A4 YWRS4424LA0 YWRS4416LA0 YWRS4412LA0	Knob Label Bus Cable Assy for WR-S4424 Bus Cable Assy for WR-S4416 Bus Cable Assy for WR-S4412
M15	YWA5DA0320A3 YWA5DA0318A3 YWA5DA0314A3 YWA7PA0059A4 YWA2SA1985A4	Ornament for WR-S4424 Ornament for WR-S4412 Ornament for WR-S4416 Badge Mounting Angle			
M16 M17	YWA6JA0126A4 YWA6JA0127A3 YWA6JB0126A4 YWA5WA1274A2 YWA5WA1275A3	Button Black Button Red Button White Upper Panel Rear Panel			
M19 M20 M21 M24 M25	YWA6JA0126A4 YWA6JA0127A3 YWA6JB0126A4 YWA5WA1274A2 YWA5WA1275A3	Button Black Button Red Button White Upper Panel Rear Panel			

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
MONO INPUT BOARD					
PCB1 (NLA) IC1,2 IC3 Q1,2 Q3-5	YWRS4400P01 YWNJM2068DD YWNJM4556DD 2SC1844-FE 2SC1684-QR	Printed Circuit Board Assy IC IC Transistor Transistor	R52-62 R63 R64-66 R67 R68	ERDS2TJ333 ERDS2TJ101 ERQ14AJ100 ERDS2TJ101 ERDS2TJ223	Carbon 33K ohms 1/4W Carbon 100 ohms 1/4W Fuse Resistor 10 ohms 1/4W Carbon 100 ohms 1/4W Carbon 22K ohms 1/4W
Q6 Q7 Q8 Q9 Q10,11	2SA564-RS 2SC1684-QR 2SA564-RS 2SK301-R 2SC1318-RS	Transistor Transistor Transistor Transistor Transistor	R70,71 R73 R74 R75 R76	EROS2CKF4702 ERDS2TJ104 ERDS2TJ562 ERDS2TJ103 ERDS2TJ101	Metal 47K ohms 1/4W Carbon 100K ohms 1/4W Carbon 5.6K ohms 1/4W Carbon 10K ohms 1/4W Carbon 100 ohms 1/4W
D1,2 D3 D5 R2,3 R4,5	MA165 LN021582PH MA167 EROS2CKF6801 EROS2CKF2202	Diode LED Diode Metal 6.8K ohms 1/4W Metal 22K ohms 1/4W	R77 R78 R79 VR2 VR3	ERDS2TJ334 ERDS2TJ152 EROS2CKF3601 EVJCC0F01465 EVJ01F01ACE	Carbon 330K ohms 1/4W Carbon 1.5K ohms 1/4W Metal 3.6K ohms 1/4W Variable Resistor 7.5K /11K ohms Variable Resistor 55K ohms
R6,7 R8 R9,10 R11,12 R13,14	EROS2CKF3301 EROS2CKF3601 ERDS2TJ100 ERDS2TJ473 EROS2CKF1501	Metal 3.3K ohms 1/4W Metal 3.6K ohms 1/4W Carbon 10 ohms 1/4W Carbon 47K ohms 1/4W Metal 1.5K ohms 1/4W	VR4 VR5,6 VR7 VR8-11 ATT1	EVJC20F01C15 EVJ01F01ACE EVJCC1F01651 EVJ01BF01A24 EVAJQ1P21Y14	Variable Resistor 100K ohms Variable Resistor 55K ohms Variable Resistor 10K ohms Variable Resistor 20K ohms Attenuator 10K ohms
R15 R16,17 R18,19 R20 R21	EROS2CKF61R9 EROS2CKF2490 EROS2CKF1501 ERDS2TJ473 ERDS2TJ333	Metal 61.9 ohms 1/4W Metal 249 ohms 1/4W Metal 1.5K ohms 1/4W Carbon 47K ohms 1/4W Carbon 33K ohms 1/4W	C1 C2,3 C4,5 C6,7 C8,9	ECEA1JU100 YWRA263T470 ECEA1CU470 YWUP05B101KN ECEA1CU220	Electrolytic 10 μF 63V Electrolytic 47 μF Electrolytic 47 μF 16V Ceramic 100 pF Electrolytic 22 μF 16V
R22 R23 R24,25 R26 R27	EROS2CKF3011 EROS2CKF1240 ERDS2TJ101 ERDS2TJ623 ERDS2TJ103	Metal 3.01K ohms 1/4W Metal 124 ohms 1/4W Carbon 100 ohms 1/4W Carbon 62K ohms 1/4W Carbon 10K ohms 1/4W	C10 C11,12 C13 C14 C15	ECEA0JU102 YWUP05B101KN ECEA1CU220 YWUP05S330JN ECEA0JU471	Electrolytic 1000 μF 6.3V Ceramic 100 pF Electrolytic 22 μF 16V Ceramic 33 pF Electrolytic 470 μF 6.3V
R28 R29 R30 R31 R32	ERDS2TJ333 ERDS2TJ221 ERDS2TJ333 ERD50FJ182 ERDS2TJ103	Carbon 33K ohms 1/4W Carbon 220 ohms 1/4W Carbon 33K ohms 1/4W Carbon 1.8K ohms 1/2W Carbon 10K ohms 1/4W	C16 C17 C18 C19 C20	ECEA1CU470 YWUP05B101KN ECEA1CU220 ECEA1HS3R3 YWUP05S220JN	Electrolytic 47 μF 16V Ceramic 100 pF Electrolytic 22 μF 16V Electrolytic 3.3 μF 50V Ceramic 22 pF
R33 R34 R35 R36 R37	ERDS2TJ183 ERDS2TJ472 ERDS2TJ333 ERDS2TJ221 ERDS2TJ333	Metal 18K ohms 1/4W Carbon 4.7K ohms 1/4W Carbon 33K ohms 1/4W Carbon 220 ohms 1/4W Carbon 33K ohms 1/4W	C21 C22,23 C24 C25 C26	ECEA1HS3R3 ECQV1H473JZ ECQB1H821JZ YWUP05S330JN YWUP05S220JN	Electrolytic 3.3 μF 50V Plastic 0.047 μF 50V Plastic 820 pF 50V Ceramic 33 pF Ceramic 22 pF
R38 R39,40 R41 R42,43 R44,45	ERD50FJ182 ERDS2TJ103 ERDS2TJ333 ERDS2TJ562 ERDS2TJ223	Carbon 1.8K ohms 1/2W Carbon 10K ohms 1/4W Carbon 33K ohms 1/4W Carbon 5.6K ohms 1/4W Carbon 22K ohms 1/4W	C27 C28 C29 C30 C31	ECQM1H123JZ ECQB1H472JZ ECEA1CU470 ECEA1CU220 YWUP05S220JN	Plastic 0.012 μF 50V Plastic 0.0047 μF 50V Electrolytic 47 μF 16V Electrolytic 22 μF 16V Ceramic 22 pF
R46,47 R48 R49 R50 R51	ERDS2TJ332 ERDS2TJ104 ERDS2TJ103 ERDS2TJ472 ERDS2TJ473	Carbon 3.3K ohms 1/4W Carbon 100K ohms 1/4W Carbon 10K ohms 1/4W Carbon 4.7K ohms 1/4W Carbon 47K ohms 1/4W	C32 C33-35 C36,37 C38,39 C41	ECEA1CU470 ECKR1H472KB5 YWR2025T221 ECKR1H472KB5 ECEA1JU100	Electrolytic 47 μF 16V Ceramic 4700 pF Electrolytic 220 μF Ceramic 4700 pF Electrolytic 10 μF 63V

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
C42	ECEA1CU470	Electrolytic 47 μ F 16V	R40	ERDS2TJ472	Carbon 4.7K ohms 1/4W
SW1-9	YWPUJ192GSNG	Push Switch	R41	ERDS2TJ103	Carbon 10K ohms 1/4W
CN1	YWRAMSA331	Connector	R42	ERDS2TJ334	Carbon 330K ohms 1/4W
CN2	YWXG4A3435	Connector	R43	ERDS2TJ104	Carbon 100K ohms 1/4W
JK1	YWYKB215010	Jack	R44	ERDS2TJ223	Carbon 22K ohms 1/4W
JK2	YWYKB215074	Jack	R45	ERDS2TJ203	Carbon 20K ohms 1/4W
JK3	YWYKB215010	Jack	R46	ERDS2TJ473	Carbon 47K ohms 1/4W
GROUP /AUX BOARD			R47	ERDS2TJ330	Carbon 33 ohms 1/4W
			R48,49	ERDS2TJ473	Carbon 47K ohms 1/4W
			R50	ERDS2TJ333	Carbon 33K ohms 1/4W
			R51	ERDS2TJ101	Carbon 100 ohms 1/4W
			R52	ER0S2CKF4991	Metal 4.99K ohms 1/4W
			R53	ER0S2CKF7871	Metal 7.87K ohms 1/4W
			R54	ERDS2TJ473	Carbon 47K ohms 1/4W
			R55	ER0S2CKF4991	Metal 4.99K ohms 1/4W
			R56	ER0S2CKF7871	Metal 7.87K ohms 1/4W
			R57	ERDS2TJ473	Carbon 47K ohms 1/4W
PCB2 (NLA)	YWRS4400P02	Printed Circuit Board Assy	R58-63	ERDS2TJ333	Carbon 33K ohms 1/4W
IC1,2	YWNJM2068DD	IC	R64-69	ERQ14AJ100	Fuse Resistor 10A
IC3	YWNJM4556DD	IC	VR2	EVJCC1F011K1	Variable Resistor 20K ohms-C
IC4,5	YWNJM2068DD	IC	VR3	EVJ01BF01A24	Variable Resistor 20K ohms-A
IC6	YWNJM4558DD	IC	VR4	EVJC20F01A24	Variable Resistor 20K ohms-A
Q1,2	2SK301-R	Transistor	VR5	EVJCS1F01679	Variable Resistor 10K ohms BH
R1	ERDS2TJ220	Carbon 22 ohms 1/4W	ATT1	EVAJQ1P21Y14	Attenuator 10K ohms
R2	ERDS2TJ333	Carbon 33K ohms 1/4W	C1	ECEA0JU471	Electrolytic 470 μ F 6.3V
R3	ERDS2TJ392	Carbon 3.9K ohms 1/4W	C2	YWUP05B101KN	Ceramic 100 pF
R4	ERDS2TJ623	Carbon 62K ohms 1/4W	C3,4	YWUP05S220JN	Ceramic 22 pF
R5,6	ERDS2TJ333	Carbon 33K ohms 1/4W	C5	ECEA1CU470	Electrolytic 47 μ F 16V
R7,8	ERDS2TJ101	Carbon 100 ohms 1/4W	C6	YWUP05B101KN	Ceramic 100 pF
R9	ERDS2TJ472	Carbon 4.7K ohms 1/4W	C7	ECEA1CU220	Electrolytic 22 μ F 16V
R10	ERDS2TJ103	Carbon 10K ohms 1/4W	C8	YWUP05S220JN	Ceramic 22 pF
R11	ERDS2TJ334	Carbon 330K ohms 1/4W	C9,10	ECEA1CU220	Electrolytic 22 μ F 16V
R12	ERDS2TJ104	Carbon 100K ohms 1/4W	C11	YWUP05S220JN	Ceramic 22 pF
R13	ERDS2TJ223	Carbon 22K ohms 1/4W	C12	ECEA1CU221	Electrolytic 220 μ F 16V
R14	ERDS2TJ912	Carbon 9.1K ohms 1/4W	C13	YWUP05S220JN	Ceramic 22 pF
R15,16	ERDS2TJ473	Carbon 47K ohms 1/4W	C14	ECEA1CU221	Electrolytic 220 μ F 16V
R17,18	ER0S2CKF1002	Metal 10K ohms 1/4W	C15	ECEA1CU220	Electrolytic 22 μ F 16V
R19	ER0S2CKF1912	Metal 19.1K ohms 1/4W	C16	ECEA0JU471	Electrolytic 470 μ F 6.3V
R20	ERDS2TJ750	Carbon 75 ohms 1/4W	C17,18	YWUP05S220JN	Ceramic 22 pF
R21	ER0S2CKF2102	Metal 21K ohms 1/4W	C19	ECEA1CU470	Electrolytic 47 μ F 16V
R22	ERDS2TJ103	Carbon 10K ohms 1/4W	C20	ECEA1CU220	Electrolytic 22 μ F 16V
R23,24	ER0S2CKF1002	Metal 10K ohms 1/4W	C21	YWUP05S220JN	Ceramic 22 pF
R25	ER0S2CKF2002	Metal 20K ohms 1/4W	C22	ECEA1CU220	Electrolytic 22 μ F 16V
R26	ERDS2TJ750	Carbon 75 ohms 1/4W	C23	YWUP05S220JN	Ceramic 22 pF
R27	ER0S2CKF2102	Metal 21K ohms 1/4W	C24	ECEA1CU101	Electrolytic 100 μ F 16V
R28	ERDS2TJ103	Carbon 10K ohms 1/4W	C25,26	ECEA1CU220	Electrolytic 22 μ F 16V
R29-31	ERDS2TJ333	Carbon 33K ohms 1/4W	C27	YWUP05B101KN	Ceramic 100 pF
R32	ERDS2TJ101	Carbon 100 ohms 1/4W	C28	ECEA1CU220	Electrolytic 22 μ F 16V
R33	ERDS2TJ220	Carbon 22 ohms 1/4W	C29	ECEA1CU470	Electrolytic 47 μ F 16V
R34-36	ERDS2TJ333	Carbon 33K ohms 1/4W	C30	YWUP05B101KN	Ceramic 100 pF
R37	ERDS2TJ473	Carbon 47K ohms 1/4W	C31	ECEA1CU220	Electrolytic 22 μ F 16V
R38,39	ERDS2TJ223	Carbon 22K ohms 1/4W	C32	ECEA1CU470	Electrolytic 47 μ F 16V
			C33	ECKF1H472ZF	Ceramic 4700 PF
			C34	ECEA1EU101	Electrolytic 100 μ F 25V (SU)
			C35	ECKF1H472ZF	Ceramic 4700 PF

REF.NO.	PART NO.	DESCRIPTION		REF.NO.	PART NO.	DESCRIPTION	
C36	ECEA1EU101	Electrolytic	100 μ F 25V (SU)	R25	ER0S2CKF2102	Metal	21K ohms 1/4W
C37	ECKF1H472ZF	Ceramic	4700 pF	R26	ERDS2TJ750	Carbon	75 ohms 1/4W
C38	ECEA1ES221	Electrolytic	220 μ F 25V(SU)	R27	ER0S2CKF2102	Metal	21K ohms 1/4W
C39	ECKF1H472ZF	Ceramic	4700 pF	R28,29	ERDS2TJ103	Carbon	10K ohms 1/4W
C40	ECEA1ES221	Electrolytic	220 μ F 25V(SU)	R30	ERDS2TJ332	Carbon	3.3K ohms 1/4W
C41	ECKF1H472ZF	Ceramic	4700 pF	R31	ERDS2TJ272	Carbon	2.7K ohms 1/4W
C42	ECEA1ES221	Electrolytic	220 μ F 25V(SU)	R33	ERDS2TJ333	Carbon	33K ohms 1/4W
C43	ECKF1H472ZF	Ceramic	4700 pF	R34	ERDS2TJ101	Carbon	100 ohms 1/4W
C44	ECEA1ES221	Electrolytic	220 μ F 25V(SU)	R35	ERDS2TJ104	Carbon	100K ohms 1/4W
C45	ECKF1H472ZF	Ceramic	4700 pF	R36	ERDS2TJ102	Carbon	1K ohms 1/4W
C46	ECEA1EU101	Electrolytic	100 μ F 25V (SU)	R37	ERDS2TJ220	Carbon	22 ohms 1/4W
C47	ECKF1H472ZF	Ceramic	4700 pF	R38	ERDS2TJ473	Carbon	47K ohms 1/4W
C48	ECEA1EU101	Electrolytic	100 μ F 25V (SU)	R39,40	ERDS2TJ333	Carbon	33K ohms 1/4W
C49	ECKF1H472ZF	Ceramic	4700 pF	R41	ERDS2TJ473	Carbon	47K ohms 1/4W
SW1-8	YWPUJ192GSNG	Push Switch		R42-44	ERDS2TJ333	Carbon	33K ohms 1/4W
CN1	YWRAMSA332NL	Connector		R45	ERDS2TJ473	Carbon	47K ohms 1/4W
CN2	YWXG4A3435	Connector		R46	ERDS2TJ334	Carbon	330K ohms 1/4W
CN3	YWS3BXHA	3-pin Connector		R47	ERDS2TJ472	Carbon	4.7K ohms 1/4W
JK1	YWYKB215074	Jack		R48	ERDS2TJ104	Carbon	100K ohms 1/4W
JK2-4	YWYKB215010	Jack		R49	ERDS2TJ223	Carbon	22K ohms 1/4W
M17	YWA2SA1985A4	Mounting Angle for Fader		R50	ERDS2TJ203	Carbon	20K ohms 1/4W
M18	YWA3BA0090A4	Supporting Angle for Jack		R51	ERDS2TJ101	Carbon	100 ohms 1/4W
MASTER L BOARD				R52	ERDS2TJ473	Carbon	47K ohms 1/4W
				R53-57	ERDS2TJ223	Carbon	22K ohms 1/4W
				R58	ERDS2TJ473	Carbon	47K ohms 1/4W
				R59	ERDS2TJ103	Carbon	10K ohms 1/4W
				R60	ERDS2TJ391	Carbon	390 ohms 1/4W
				R61	ERDS2TJ333	Carbon	33K ohms 1/4W
				R62	ERDS2TJ473	Carbon	47K ohms 1/4W
				R63	ERDS2TJ103	Carbon	10K ohms 1/4W
				R64	ERDS2TJ223	Carbon	22K ohms 1/4W
				R65	ERDS2TJ473	Carbon	47K ohms 1/4W
PCB3 (NLA)	YWRS4400P03	Printed Circuit Board Assy		R66-75	ERDS2TJ333	Carbon	33K ohms 1/4W
IC1,2	YWNJM2068DD	IC		R76	ERDS2TJ273	Carbon	27K ohms 1/4W
IC3	YWNJM4556DD	IC		R77	ERDS2TJ223	Carbon	22K ohms 1/4W
IC4	YWNJM2068DD	IC		R78-81	ERQ14AJ100	Fuse Resistor	10A
IC5	YWUPD6360C	IC		VR2	EVJ01BF01A24	Variable Resistor	20KA ohms
IC6	YWNJM4558DD	IC		VR3	EVJC20F01A24	Variable Resistor	20KA ohms
IC7	YWNJM2068DD	IC		VR4	EVJCC0F01463	Variable Resistor	20K/20K ohms
Q1,2	2SK301-R	Transistor		ATT1	EVAJQ1P21Y14	Attenuator	10K ohms
Q3,4	2SC1684-QR	Transistor		C1	ECEA0JU471	Electrolytic	470 μ F 6.3V
R1	ERDS2TJ220	Carbon	22 ohms 1/4W	C2	YWUP05B101KN	Ceramic	100 pF
R2	ERDS2TJ623	Carbon	62K ohms 1/4W	C3,4	YWUP05S220JN	Ceramic	22 pF
R3	ERDS2TJ392	Carbon	3.9K ohms 1/4W	C5	ECKF1H472ZF	Ceramic	4700 pF
R4-6	ERDS2TJ333	Carbon	33K ohms 1/4W	C6	ECEA1CU470	Electrolytic	47 μ F 16V
R7,8	ERDS2TJ101	Carbon	100 ohms 1/4W	C7	YWUP05B101KN	Ceramic	100 pF
R9,10	ERDS2TJ103	Carbon	10K ohms 1/4W	C8	ECEA1CU220	Electrolytic	22 μ F 16V
R11	ERDS2TJ912	Carbon	9.1K ohms 1/4W	C9	YWUP05S220JN	Ceramic	22 pF
R12	ERDS2TJ472	Carbon	4.7K ohms 1/4W	C10,12	ECEA1CU220	Electrolytic	22 μ F 16V
R13	ERDS2TJ334	Carbon	330K ohms 1/4W	C13	ECKF1H472ZF	Ceramic	4700 pF
R14	ERDS2TJ104	Carbon	100K ohms 1/4W	C14,15	YWUP05S220JN	Ceramic	22 pF
R15	ERDS2TJ223	Carbon	22K ohms 1/4W	C16,17	ECEA1CU221	Electrolytic	220 μ F 16V
R16,17	ERDS2TJ473	Carbon	47K ohms 1/4W	C18	ECEA0JU471	Electrolytic	470 μ F 6.3V
R18-21	ER0S2CKF1002	Metal	10K ohms 1/4W	C19	ECKF1H222KB	Ceramic	2200 pF 50V
R22	ER0S2CKF1912	Metal	19.1K ohms 1/4W	C20	YWUP05S220JN	Ceramic	22 pF
R23	ER0S2CKF2002	Metal	20K ohms 1/4W				
R24	ERDS2TJ750	Carbon	75 ohms 1/4W				

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
C21	ECKF1H222KB	Ceramic 2200 pF 50V	MASTER R BOARD		
C22,23	ECEA1CU220	Electrolytic 22 μ F 16V	PCB4 (NLA)	YWRS4400P04	Printed Circuit Board Assy
C24	ECKF1H222KB	Ceramic 2200 pF 50V	IC1,2	YWNJM2068DD	IC
C25	YWUP05S220JN	Ceramic 22 pF	IC3	YWNJM4556DD	IC
C26	ECEA1CU470	Electrolytic 47 μ F 16V	IC4	YWM5201P	IC
C27	ECEA1CU220	Electrolytic 22 μ F 16V	IC5	YWNJM4556DD	IC
C28	YWUP05S220JN	Ceramic 22 pF	Q1,2	2SK301-R	Transistor
C29	ECEA1CU470	Electrolytic 47 μ F 16V	Q3,4	2SC1684-QR	Transistor
C30	ECEA1CU220	Electrolytic 22 μ F 16V	R1	ERDS2TJ220	Carbon 22 ohms 1/4W
C31,32	YWUP05S220JN	Ceramic 22 pF	R2	ERDS2TJ623	Carbon 62K ohms 1/4W
C33	ECEA1CU220	Electrolytic 22 μ F 16V	R3	ERDS2TJ392	Carbon 3.9K ohms 1/4W
C34	YWRA263V330	Electrolytic 33 μ F	R4-6	ERDS2TJ333	Carbon 33K ohms 1/4W
C35	ECEA1EU101	Electrolytic 100 μ F 25V (SU)	R7,8	ERDS2TJ101	Carbon 100 ohms 1/4W
C36	YWUP05S220JN	Ceramic 22 pF	R9,10	ERDS2TJ103	Carbon 10K ohms 1/4W
C37,38	ECEA1CU220	Electrolytic 22 μ F 16V	R11	ERDS2TJ912	Carbon 9.1K ohms 1/4W
C39	YWUP05S220JN	Ceramic 22 pF	R12	ERDS2TJ472	Carbon 4.7K ohms 1/4W
C40	ECEA1CU470	Electrolytic 47 μ F 16V	R13	ERDS2TJ334	Carbon 330K ohms 1/4W
C41	ECKF1H472ZF	Ceramic 4700 pF	R14	ERDS2TJ104	Carbon 100K ohms 1/4W
C42,43	ECEA1EU101	Electrolytic 100 μ F 25V (SU)	R15	ERDS2TJ223	Carbon 22K ohms 1/4W
C44,45	ECKF1H472ZF	Ceramic 4700 pF	R16,18	ERDS2TJ473	Carbon 47K ohms 1/4W
C46,47	ECEA1ES221	Electrolytic 220 μ F 25V(SU)	R19-22	ER0S2CKF1002	Metal 10K ohms 1/4W
C48,49	ECKF1H472ZF	Ceramic 4700 pF	R23	ER0S2CKF1912	Metal
C50,51	ECEA1ES221	Electrolytic 220 μ F 25V(SU)	R24	ER0S2CKF2002	Metal 20K ohms 1/4W
C52,53	ECKF1H472ZF	Ceramic 4700 pF	R25	ERDS2TJ750	Carbon 75 ohms 1/4W
C54,55	ECEA1ES221	Electrolytic 220 μ F 25V(SU)	R26	ER0S2CKF2102	Metal 21K ohms 1/4W
C56	ECEA1CU220	Electrolytic 22 μ F 16V	R27	ERDS2TJ750	Carbon 75 ohms 1/4W
SW1-7	YWPUJ192GSNG	Push Switch	R28	ER0S2CKF2102	Metal 21K ohms 1/4W
CN1	YWRAMS332NL	Connector	R29,30	ERDS2TJ103	Carbon 10K ohms 1/4W
CN2	YWXG4A3435	Connector	R31	ERDS2TJ332	Carbon 3.3K ohms 1/4W
CN3	YWS3BXHA	3-pin Connector	R32	ERDS2TJ272	Carbon 2.7K ohms 1/4W
JK1	YWYKB215010	Jack	R33	ERDS2TJ333	Carbon 33K ohms 1/4W
JK2	YWYKB215074	Jack	R34	ERDS2TJ101	Carbon 100 ohms 1/4W
JK3	YWYKB215010	Jack	R35	ERQ12AJ2R2P	Fuse Resistor 2.2 ohms
JK4	YKC213048	Jack	R36	ERDS2TJ104	Carbon 100K ohms 1/4W
M17	YWA2SA1985A4	Mounting Angle	R37	ERDS2TJ102	Carbon 1K ohms 1/4W
M22	YWA3BA0085A4	Supporting Angle	R38	ERD25FJ272	Carbon 2.7K ohms 1/4W
M23	YWA3BA0086A4	Supporting Angle	R39	ERDS2TJ473	Carbon 47K ohms 1/4W
			R40	ERDS2TJ102	Carbon 1K ohms 1/4W
			R41-43	ERDS2TJ473	Carbon 47K ohms 1/4W
			R44	ERDS2TJ334	Carbon 330K ohms 1/4W
			R45	ERDS2TJ472	Carbon 4.7K ohms 1/4W
			R46	ERDS2TJ104	Carbon 100K ohms 1/4W
			R47	ERDS2TJ203	Carbon 20K ohms 1/4W
			R48	ERDS2TJ223	Carbon 22K ohms 1/4W
			R49	ERDS2TJ473	Carbon 47K ohms 1/4W
			R50	ERDS2TJ101	Carbon 100 ohms 1/4W
			R51	ERDS2TJ473	Carbon 47K ohms 1/4W
			R52	ERDS2TJ392	Carbon 3.9K ohms 1/4W
			R53	ERDS2TJ473	Carbon 47K ohms 1/4W
			R54	ERDS2TJ392	Carbon 3.9K ohms 1/4W
			R55,56	ERDS2TJ223	Carbon 22K ohms 1/4W

REF.NO.	PART NO.	DESCRIPTION		REF.NO.	PART NO.	DESCRIPTION	
R57,58	ERDS2TJ103	Carbon	10K ohms 1/4W	LED METER BOARD			
R59,60	ERDS2TJ750	Carbon	75 ohms 1/4W				
R61	ERDS2TJ220	Carbon	22 ohms 1/4W	PCB5 (NLA)	YWRS4400P05	Printed Circuit Board Assy	
R64-67	ERQ14AJ100	Fuse Resistor	10 ohms	IC1-6	AN6891	IC	
VR2	EVJC20F01A24	Variable Resistor	20K ohms	D1-6	LN121185P	LED	
ATT1	EVAJQ1P21Y14	Attenuator	10K ohms	D7,8	LN220RP	LED	
C1	ECEA0JU471	Electrolytic	470 F 6.3V	R1-6	ERDS2TJ223	Carbon	22K ohms 1/4W
C2	YWUP05B101KN	Ceramic	100 pF	R7	ERDS2TJ224	Carbon	220K ohms 1/4W
C3,4	YWUP05S220JN	Ceramic	22 pF	R8	ERDS2TJ682	Carbon	6.8K ohms 1/4W
C5	ECEA1CU470	Electrolytic	47 μF 16V	R9	ERDS2TJ221	Carbon	220 ohms 1/4W
C6	YWUP05B101KN	Ceramic	100 pF	R10	ERDS2TJ224	Carbon	220K ohms 1/4W
C7	ECEA1CU220	Electrolytic	22 μF 16V	R11	ERDS2TJ682	Carbon	6.8K ohms 1/4W
C8	YWUP05S220JN	Ceramic	22 pF	R12	ERDS2TJ221	Carbon	220 ohms 1/4W
C9,11	ECEA1CU220	Electrolytic	22 μF 16V	R13	ERDS2TJ224	Carbon	220K ohms 1/4W
C12,13	YWUP05S220JN	Ceramic	22 pF	R14	ERDS2TJ682	Carbon	6.8K ohms 1/4W
C14,15	ECEA1CU221	Electrolytic	220 μF 16V	R15	ERDS2TJ221	Carbon	220 ohms 1/4W
C16-20	ECEA1CU220	Electrolytic	22 μF 16V	R16	ERDS2TJ224	Carbon	220K ohms 1/4W
C21	YWUP05S220JN	Ceramic	22 pF	R17	ERDS2TJ682	Carbon	6.8K ohms 1/4W
C22	ECEA1CU470	Electrolytic	47 μF 16V	R18	ERDS2TJ221	Carbon	220 ohms 1/4W
C23,24	ECEA1CU220	Electrolytic	22 μF 16V	R19	ERDS2TJ224	Carbon	220K ohms 1/4W
C25,26	YWUP05S220JN	Ceramic	22 pF	R20	ERDS2TJ682	Carbon	6.8K ohms 1/4W
C27,28	ECEA1CU221	Electrolytic	220 μF 16V	R21	ERDS2TJ221	Carbon	220 ohms 1/4W
C29	YWUP05B101KN	Ceramic	100 pF	R22	ERDS2TJ224	Carbon	220K ohms 1/4W
C32,33	ECEA1EU101	Electrolytic	100 μF 25V (SU)	R23	ERDS2TJ682	Carbon	6.8K ohms 1/4W
C34,35	-ECKR1H472KB5	Ceramic	4700 pF	R24	ERDS2TJ221	Carbon	220 ohms 1/4W
C36,37	ECEA1ES221	Electrolytic	220 μF 25V(SU)	R25	ERD50FJ182	Carbon	1.8K ohms 1/2W
C38,39	ECEA1EU470	Electrolytic	47 μF 25V (SU)	VR1-6	EVND2AA03B53	Variable Resistor 5K ohms	
C40,41	ECKF1H472ZF	Ceramic	4700 pF	C1	ECEA1HU2R2	Electrolytic	2.2 μF 50V
C42,43	ECEA1ES221	Electrolytic	220 μF 25V(SU)	C2	ECQV1H104JZ	Plastic	0.1 μF 50V
C44-46	ECKF1H472ZF	Ceramic	4700 pF	C3	ECEA1HU2R2	Electrolytic	2.2 μF 50V
SW1,2	YWPUJ192GSNG	Push Switch		C4	ECEA1CSS221	Electrolytic	220 μF 16V
CN1	YWRAMSA332NL	Connector		C5	ECEA1HU2R2	Electrolytic	2.2 μF 50V
CN2	YWXG4A3435	Connector		C6	ECQV1H104JZ	Plastic	0.1 μF 50V
CN3	YWS5BXHA	5-pin Connector		C7	ECEA1HU2R2	Electrolytic	2.2 μF 50V
CN4	YWB7BXHA	7-pin Connector		C8	ECEA1CSS221	Electrolytic	220 μF 16V
CN5	YWRAMSA331	Connector		C9	ECEA1HU2R2	Electrolytic	2.2 μF 50V
CN6	YWB3BXHA	3-pin Connector		C10	ECQV1H104JZ	Plastic	0.1 μF 50V
JK1	YWYKB215010	Jack		C11	ECEA1HU2R2	Electrolytic	2.2 μF 50V
JK2	YWYKB215074	Jack		C12	ECEA1CSS221	Electrolytic	220 μF 16V
JK3	YWYKB215010	Jack		CN1	YWS8BEH	8-pin Connector	
JK4	YKC213048	Jack		CN2	YWS7BEH	7-pin Connector	
JK5	YWYKB215010	Jack		M30	YWA2NB0257A4	LED Spacer	
M17	YWA2SA1985A4	Mounting Angle					
M22	YWA3BA0085A4	Supporting Angle					
M23	YWA3BA0086A4	Supporting Angle					
M57	YWA3BA0087A4	Supporting Angle					

REF.NO.	PART NO.	DESCRIPTION	REF.NO.	PART NO.	DESCRIPTION
POWER SWITCH BOARD					
PCB6 C1,2 Δ SW1 Δ CN1 E1	YWRS4400PA0 ECKDRS222ME ESB70927V YWB3P5VH YW851040	Printed Board Ceramic 2200 pF Push Switch 3-pin Connector Insulator Cover	R35 C3 C4,5 C6,7 C8,9	ERDS2TJ104 ECQM1104KZ ECEB1VU682 ECQB1H103JZ YWR2025V331	Carbon 100K ohms 1/4W Plastic 0.1 μ F 100V Electrolytic 6800 μ F 35V Plastic 0.01 μ F 50V Electrolytic 330 μ F 25V
E2 E3	YWF105 YWA2QA0054A4	Fuse Holder Electrode	C10,11 C12 C13 C14 C15	ECQB1H103JZ ECQM2104KZ ECES1KV102S ECQM1103KZ ECEA1JU330	Plastic 0.01 μ F 50V Plastic 0.1 μ F Electrolytic 1000 μ F Plastic 0.01 μ F 100V Electrolytic 33 μ F 1.6V
POWER SUPPLY BOARD			C16 C17 C18 C19 C20	ECEA1JU331 ECQM1103KZ ECQV1H104JZ ECEB1EU472 ECQB1H103JZ	Electrolytic 330 μ F 1.6V Plastic 0.01 μ F 100V Plastic 0.1 μ F 50V Electrolytic 4700 μ F 25V Plastic 0.01 μ F 50V
PCB7 (NLA) IC1 IC2 Q1 Q2 Q3	YWRS4400PA2 YWNJM7812FA YWTA7317P 2SB943-PQ 2SD1268-PQ 2SC1684-QR	Printed Circuit Board Assy IC IC Transistor Transistor Transistor	C21 C22 C23 C24 C26	ECEA1CU221 ECQB1H103JZ ECEA1VU100 ECEA1CU220 ECEA1HS3R3	Electrolytic 220 μ F 16V Plastic 0.01 μ F 50V Electrolytic 10 μ F 35V Electrolytic 22 μ F 16V Electrolytic 3.3 μ F 50V
Q4 Q6 Q7 Q8 D1	2SA564-RS 2SD1276A-QR 2SC1684-QR 2SA564-RS YWRB402F	Transistor Transistor Transistor Transistor Rectifier	C27,28 CN2 CN3 M44 M45	YWRA225V471 YWB7P5VH YWXG4A3435 YWA2KA0706A4 YWA7DA0303A4	Electrolytic 470 μ F 25V 7-pin Connector Connector Chassis Heat Sink
D2,3 D4-7 D8,9 D10 D11	MA165 YWAM01Z YWHZS27EB2 YWRB152F MA167	Diode Diode Diode Diode Diode	M56	YWAC-256	Insulator
D12 D13,14 R3,4 R5,6 R11	MA165 YWHZS16EB2 ERQ12HUKR39P ERDS2TJ152 ERQ12AJ4R7P	Diode Diode Fuse Resistor 0.39 ohms Carbon 1.5K ohms 1/4W Fuse Resistor 4.7 ohms	ACCESSORY PARTS/PACKAGING PARTS		
R12 R13 R15 R16 R17	ERDS2TJ472 ERDS2TJ103 ERQ12AJ2R2P ERDS2TJ153 ERDS2TJ104	Carbon 4.7K ohms 1/4W Carbon 10K ohms 1/4W Fuse Resistor 2.2 ohms Carbon 15K ohms 1/4W Carbon 100K ohms 1/4W	M101 M102	YWA8QA2680AN YWA8EA0154A4 YWA8EB0154A4 YWA8EC0154A4	Operating Instructions Polyethylene Bag for WR-S4412 Polyethylene Bag for WR-S4416 Polyethylene Bag for WR-S4424
R18 R19 R20 R22 R23	ERDS2TJ473 ERDS2TJ224 ERDS2TJ682 ERDS2TJ473 ERDS2TJ104	Carbon 47K ohms 1/4W Carbon 220K ohms 1/4W Carbon 6.8K ohms 1/4W Carbon 47K ohms 1/4W Carbon 100K ohms 1/4W	M103 M104 M110	YWT20X35C03 XZB26X40C05 YWA9CA1753AN YWA9CA1754AN YWA9CA1755AN	Polyethylene Bag Polyethylene Bag Packaging Assy for WR-S4412 Packaging Assy for WR-S4416 Packaging Assy for WR-S4424
R24 R25 R27 R28,29 R30,31	ERDS2TJ473 ERDS2TJ103 ERDS2TJ392 ERDS2TJ681 ERDS2TJ103	Carbon 47K ohms 1/4W Carbon 10K ohms 1/4W Carbon 3.9K ohms 1/4W Carbon 680 ohms 1/4W Carbon 10K ohms 1/4W			